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Development and Initial Results of a Longitudinal Secondary Follow-up Study

Follow-up studies of secondary school students have the potential to contribute significantly to our understanding of the relationship between secondary school, further education, and employment. However, many of the studies which have been done suffer from serious methodological problems, including poor response rates and weak conceptualization. The Peel Secondary Follow-up Study, involving a multi-cohort, multi-contact design, is described. Results from the first round of the study raise important issues of students' expectations and the way in which these are—or, just as frequently, are not—borne out.

In theory, at least, schools are justified largely in terms of what will happen to students at some later time. Whereas a business or a hospital attempts to secure desired outcomes immediately—this year's profit or this week's cures—schools have the difficult task of showing that they have a positive impact on people years after these people have left the institution.

The follow-up study is one way of trying to find out something about what happens to students after they leave school and, by implication, a way of making judgments about school programs. The literature on follow-up studies is reviewed in this paper, some of the difficulties in conducting such studies are commented on, and an initial attempt by a large Canadian Board of Education to design and implement a follow-up study which would overcome some of these difficulties is described.

Review of Literature

The intrinsic appeal of the follow-up study idea leads one to suppose that such studies are common. However relatively few have been reported in the literature. A

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search of sources including RIE, CIJE, ONTERIS, and the Canadian Education Index revealed fewer than two dozen secondary school follow-up studies conducted since 1972. Most of the references obtained were from RIE and were thus unpublished documents, often written to meet the requirements of various United States federal funding programs.

There is considerable range in the studies in terms of size and sophistication. Most common are school district studies which attempt to contact recent graduates and assess the value of their high school education or some portion of it (Finn, 1977; Preston, 1975; Sprumont, 1977). Some more extensive efforts have been made at a state or provincial level. For example, Anisef, Paasche and Turrittin (1980) resurveyed students who had initially been surveyed in 1974 while in Grade 12 in Ontario. A series of studies in Manitoba (Russell, 1980) culminated in a review of the relationship of expressed high school intentions with actual postsecondary activities.

The largest studies, however, have been national studies in the United States which have followed students over a long period of time. Project Talent sampled high school students in 1960, and again one, five, and eleven years later. However, by the final survey less than a third of the sample could be located (Call, Otto & Spenner, 1982, p. 63). The more recent National Longitudinal Study of the Class of 1972 includes data on 20,000 students who were seniors in 1973, and who have been resurveyed in 1974, 1976, and 1979. The NLS has also made its data base, containing more than 3,500 pieces of information about each respondent, available to other researchers. By 1981 some 320 studies had been completed or were in progress using NLS data (Taylor, Stafford & Place, 1981). NLS has now been superseded by the High School and Beyond study, with data on 58,000 high school seniors and sophomores in 1980, plus responses from their parents and teachers.

The flavour of the literature can best be given by discussing several methodological dimensions of the work. These include issues of basic design, data collection methods, comprehensiveness of response, and content.

Design

Most follow-up studies are one-time efforts; that is, a single group of former students is contacted at some point after leaving the school. However, there are variations on this procedure. The first is to include students from more than one cohort in the study. For example, Sprumont (1977) included students from five consecutive graduating classes. Harris, Abrams and Simpson (1972) included two consecutive classes of graduates. Righthand (1977) surveyed graduates from 1965, 1968, and 1971. A second variation, a more rarely used procedure, is to contact the same set of students on more than one occasion after they leave school (Smedley & Olson, 1975). This is the procedure used in the National Longitudinal Study, which has surveyed 1972 high school seniors in 1974, 1976, and 1979. Anisef, Paasche and Turrittin (1980) and Russell (1980) also resurveyed students after a period of several years. Both these procedures, but especially the second one, create considerable problems in terms of finding students and keeping track of them for later contact. Perhaps for this reason, in only a few studies is an attempt made to contact students more than two or three years after they leave school (e.g., Russell, 1980; Bettis & Hyder, 1978; Crim & Ross, 1976).

Data Collection Methods

Two basic methods have been used for follow-up studies. Mailed questionnaires are more common, with telephone interviews a second choice. Krucek (1975) compared these methods as well as personal interviews, and found that telephone interviews combined with mail questionnaires provided a higher response rate at lower cost. Similar results at the junior college level were obtained by Sheldon (1977).

The evidence on mailed questionnaires indicates that at least three mailings are required to obtain an adequate response. Harris, Abrams and Simpson (1972) obtained responses from 35% on the first mailing, but 80% after three mailings and a telephone reminder. Preston (1975) had a response rate of 72% after three mailings and two telephone reminders. Krucek (1975) had returns from 50% after three mailings. Lewis (1976) reports a 75% response after mailings. These studies include a variety of other devices, such as personal letters from high school principals, reminder cards, and the like to increase response rates. Of the telephone studies, Crim & Ross (1976) and Krucek (1975) both report a 66% response.

Response Rates

A crucial aspect of any follow-up study is the final response rate. These vary greatly, from as low as 12% (Bettis & Hyder, 1978), or 28% (Finn, 1977) to as high as 80% (Harris, Abrams & Simpson, 1972). For the studies reviewed, a response rate of 50% to 60% was about average, and there is evidence (Righthand, 1977; Smedley & Olson, 1975) that many unpublished studies have even lower returns. On the other hand, the National Longitudinal study has been able to maintain a response rate of some 85%, even seven years after the initial survey.

Response rates vary on a number of dimensions. Not surprisingly, rates are higher when the study is done soon after students leave school. The longer the wait, the lower the response rate in general, although NLS is an exception. There is considerable evidence that respondents and nonrespondents vary on significant dimensions (Taylor, Stafford & Place, 1981; Herrnstadt, Horowitz & Sum, 1979). Furthermore, those in the sample who are not located may well be significantly different from those who are contacted (Call, Otto & Spenner, 1982).

The studies reviewed vary in the intensity of efforts to contact all former students in the sample. In some studies no such efforts were made (Righthand, 1977). In other cases efforts to obtain new addresses for students who had moved were made, with varying success. However, the potential for reaching all former students is illustrated by two methodological studies. Call, Otto and Spenner (1982) attempted in the Career Development Study to find 7,000 Washington State students 13 years after high school. Ninety-six percent were located. Clarridge, Havser and Sheehy (1976) found 97.4% of more than 10,000 former students in Wisconsin, 17 years after they left high school! Clarridge's results were aided by additional data obtained from respondents in 1957, such as information on parents' occupation. These studies illustrate that response rates can be very high if sufficient effort is invested in the study.

Content

There is far less variance among studies in terms of the questions asked of students than in the methodological elements. For the most part data fall into two areas. Much of the information concerns occupational and educational outcomes for

former students—jobs held, earnings, unemployment if any, areas of further education, on-the-job training, and so on. All of the studies have collected at least some of this information. In addition, most studies have asked respondents to comment on various aspects of their high school education. Common areas here include general quality of program, relevance to current activity, adequacy of counselling services, preparation for employment and the like.

To review all the results from previous studies is beyond the scope of this paper. In many cases, however, it must be noted that results are called into question by the low response rates of the studies.

Two issues are of particular interest. As noted above, a few studies have sought to compare students' intentions as expressed while in high school with their actual activity after leaving high school. Russell (1980) found that the reliability of expressed intentions of Grade 12 students in Manitoba was higher for those planning University education (70% of whom actually enrolled) than for those planning community college education (30% of whom enrolled). In a study in Ontario, Anisef, Paasche, and Turriffin (1980), found that 78% of those intending university enrolled, 56% of those intending community college enrolled, and 88% of those intending to work did so. In a similar vein, Alexander and Cook (1979) argue that students' expressed educational and career plans are often extemporaneous. Thus, it would appear that institutions should not rely heavily on the expressed intentions of students. Secondly, there is evidence that data on income and occupation provided by respondents are of uncertain validity (Taylor, Stafford & Place, 1981).

Design of the Study

The Peel Secondary Follow-up Study was designed to provide information to the Peel system on the post-high school outcomes of Peel students. Its primary purpose was to assist program planning for secondary schools, particularly in light of some of the major suggestions for redirection which were contained in the report of Ontario's Secondary Education Review Project (SERP). Once the actual post-high school activities of Peel students are better known, it should be possible to improve their fit with school programs. In the first round of the study it was decided to collect only basic data about respondents' current activities—status (worker, student, etc.), place of study or employment, and specific job or program. In addition, respondents would be asked whether their current status was what they had anticipated when in Grade 11. More data, if desired, could be built into the 1984 study.

The study was designed specifically to overcome some of the major flaws in the previous literature. Four of these were of particular concern. Unless a high response rate could be obtained, the results would not safely allow generalization for all Peel students. Thus a key concern was achieving a high response rate. A second weakness in the literature is the very short interval in many studies between students' departure from school and the data collection. It was felt that career paths would not be visible for several years after leaving high school. Thus the study would have to reach students some time after they left school.

Similarly, because people's intentions and activities change over time, a multiple contact approach, in which each respondent is contacted more than once, was called for. Such an approach allows a picture to emerge of changes in individuals' lives. Finally, in order to get a clearer picture of school effects, it was thought necessary

to include more than one cohort in the study. The design would then allow comparison both across years and across cohorts of students.

The final design, then, called for the inclusion in the study of a new cohort of students every two years, and the contacting of each cohort every two years for ten years. The first “round” of the study would include two groups of students, but when fully developed, there would be five groups of students in each round, ranging from two to ten years after their initial identification (see Figure 1).

<u>Year Sampled</u>	<u>Years for Data Collection</u>				
	<u>1982</u>	<u>1984</u>	<u>1986</u>	<u>1988</u>	<u>1990</u>
1977-78	x	x	x	x	
1979-80	x	x	x	x	x
1981-82		x	x	x	x
1983-84			x	x	x
1985-86				x	x
1987-88					x

Figure 1. Follow-up study design.

Telephone interviews were chosen as the data collection method for the first round. Because the questions to be asked were relatively non-controversial, anonymity was not felt to be a major concern. Telephone interviewing provides a more personal contact than mailing questionnaires. Furthermore, the evidence from the literature was that telephone interviews would provide a higher response rate at a lower cost than would mailed questionnaires. This was particularly true in a study such as this one, in which the interview takes only two or three minutes to conduct. Interviewers were hired on contract to conduct the interviews. In later rounds of the study, however, a variety of data collection methods will likely be used.

Grade 11 was selected as the base year for sampling purposes. The great majority of students are still at school at this age, so that the sample would be similar to the entering high school population. Further, grade 11 students are able to give informed consent to participate in the study. As well, the time between initial contact in Grade 11 and the first survey, two years later, would mean fewer students “lost” due to moves.

For the 1981 Grade 11 sample, as will be done in future samples, students were contacted while in Grade 11 and asked to agree to participate in the study, whose purpose and ongoing nature were explained. Students were also given the option of refusing to take part. Students who agreed were asked to complete an “Agreement to Participate” and to supply information to help locate them should they move—parents’ occupations and employers, and the address of a close friend or relative. These are among the data suggested by Call, Otto and Spenner (1982) as most useful in later locating those in a follow-up study. Students were contacted repeatedly by letter and telephone until they indicated agreement or refusal to take part in the study.

Had we begun with the 1981 sample, however, no data would have been available until 1984, and even then many students would be either still in high school or just out of school. We therefore decided to include cohorts from the 1977-78 and 1979-80 Grade 11 classes. A 10% random sample of Grade 11 students from

each year was drawn from the records of each secondary school. Approximately 750 names were in each sample (see Figure 2).

The remainder of this paper presents data for the first round of the study, including the 1977 and 1979 cohorts.

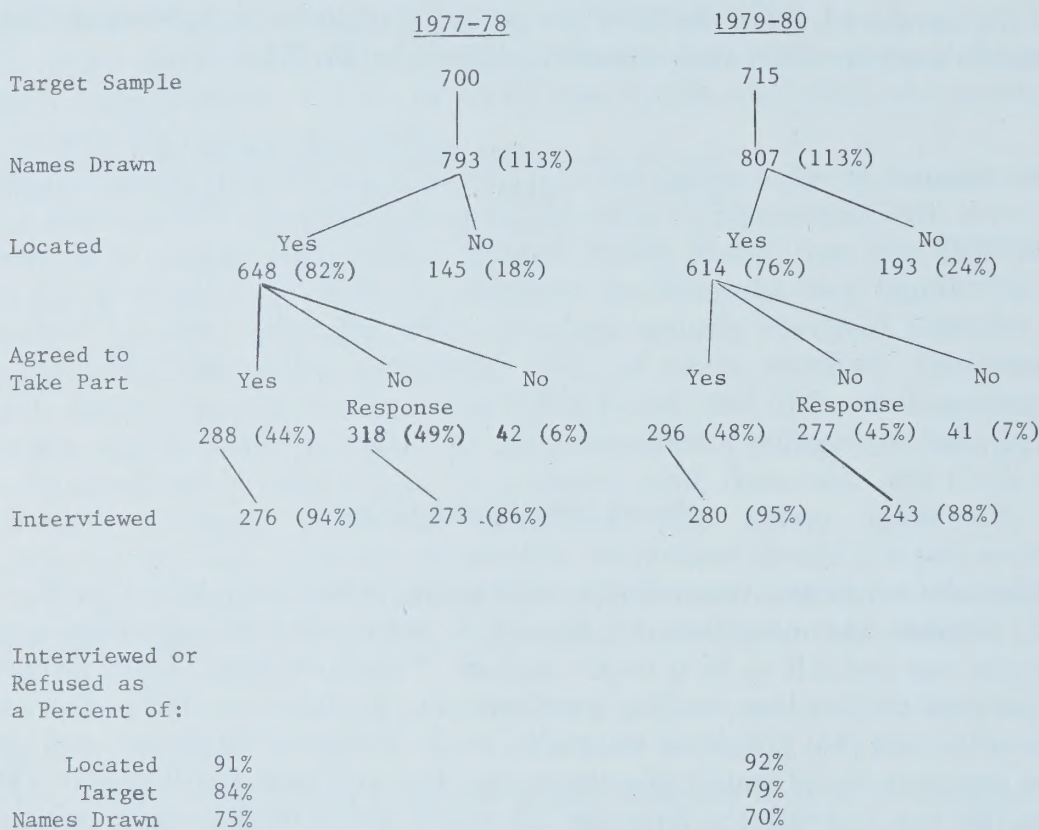


Figure 2. Response rates.

Locating and Contacting Former Students

The first task was to obtain current addresses and telephone numbers for the students in the sample, beginning with the addresses contained in school records. We verified as many of these as we could by checking with current telephone directories. About three-quarters of the families were still at the same addresses or had the same telephone numbers. Where a listing could not be verified in this way, we called the student's previous number in an attempt to obtain a current number. This procedure produced what we thought were accurate addresses for 82% of the 1977 and 76% of the 1979 sample. Of these, 37% of the 1977 cohort and 20% of the 1979 group were changed from the original school records.

Letters explaining the study, and including the "Agreement to Participate," the "Information Sheet," and a stamped return envelope were then sent to located addresses. Word processing equipment was used to produce personal letters and envelopes for each respondent. This mailing produced 44% to 48% completed agreements, 3% refusals, and 3% wrong addresses.

We then began data collection through telephone interviewing. Because the response rate to the letter was only 48%, just about what the literature would lead one to expect (Call, Otto & Spenner, 1982), we decided to try contacting all those in the sample who had not actually returned a refusal form. The interviewers were given separate instructions and procedures for use with nonrespondents.

Contact by telephone proved quite successful. At the time of writing about 95% of those who agreed to participate have provided data. As well, about 90% of the nonrespondents have also been contacted, some of whom (about 8%) refused to participate. Some persons have not yet been reached. A number of the nonrespondents were no longer at the addresses we had for them.

Figure 2 summarizes the results of this section. Of the names in the original sample, at the time of writing this we had data from more than 70%, refusals from 6%, and were still trying to obtain addresses or to contact the remaining 24%.

Maintaining High Response Rates

We concentrated initially on obtaining data from those for whom addresses or phone numbers have been obtained. Only limited efforts have been made to locate other members of the sample. However, even these limited efforts, relying largely on contacting neighbours at the previous address and calling potential relatives drawn from city directories, have been productive. Over the course of the study more than 100 sample members have been located using these techniques.

We are now making more intensive efforts to locate the persons in the sample for whom we do not yet have addresses. Our procedures include, in addition to those mentioned, going back to school records for additional information, looking for siblings now in the schools, and contacting former classmates. We expect, based on our experience so far, to locate at least two-thirds of these remaining sample members. Including data from them and from those not yet contacted, we expect eventually to have data from more than 90% of the original sample. This response rate would be higher than any other documented study done by a school district, and would be exceeded only by such major efforts as the National Longitudinal Study, and the Career Development Study cited earlier.

Although these procedures to increase response rate may seem very troublesome, our data indicate that they are necessary. We compared respondents who returned the Agreement form with those who did not but who provided data when contacted. The two groups differed significantly on several dimensions. Compared with voluntary respondents, nonrespondents were significantly more likely to be male ($F=24.26$, $df=2$, $p<.001$), to be working rather than studying ($F=21.44$, $df=10$, $p<.02$), and not to be from vocational schools ($F=13.8$, $df=2$, $p<.001$).

Fifty-six percent of the 1977 cohort and 48% of the 1979 cohort reported being in the labour force. Of these, 7% and 14% respectively reported being unemployed when surveyed.

Almost all the remaining respondents were students, including 43% of the 1977 group and 52% of the 1979 group. In the former cohort 62% of the student group were in university, 36% in college, and 2% in other educational programs. Not surprisingly, the 1979 group was distributed quite differently, with 80% of the students in grade 13, 16% in colleges, and 4% elsewhere. Most students in both groups—more than 90%—were enrolled in educational institutions near home.

There were no statistically significant differences between males and females in terms of labour force participation or continued education.

Table 1 provides further information on the occupations of the former students. The table shows that most respondents are in the entry-level jobs, such as clerical, labour, or sales. While these three categories account for 55% of the 1977 cohort in the labour force and 47% of the 1979 cohort, they comprise only 38% of the

Ontario labour force as a whole. Not surprisingly, there are very few former students in professional or managerial categories.

TABLE 1
OCCUPATIONS OF RESPONDENTS

	Clerical	Sales	Service	Production	Labour	Mechanical	Other
1977-78 (N=305)	33%	12%	10%	8%	6%	6%	25%
1979-80 (N=231)	22%	16%	9%	12%	10%	4%	27%

Examples of the types of jobs under these categories are:

Clerical - secretary, accounts payable clerk, bank teller, order desk clerk.

Sales - cashier, salesperson, pricing department worker.

Service - bartender, travel agent, waiter, security officer, police cadet.

Production - assembly operator, equipment operator, machine operator.

Labour - air conditioning helper, gas attendant, parks maintenance worker.

Mechanical - diesel mechanic, plumber, refrigeration apprentice, telephone maintenance person.

The use of broad categories should not, however, obscure the very great range of actual jobs being held by former students. These range across the entire gamut of occupations in the economy, including all of the major census occupational categories.

Table 2 indicates the length of time respondents report having worked for their current employers. Only a small proportion of students (5%, or 29 in 1977 and 3%, or 15 in 1979) report involvement in a formal job training program such as an apprenticeship. An overwhelming majority of these students are male (86% in 1977 and 73% in 1979). Moreover, many of those in such programs (48% in 1977, 33% in 1979) expected in grade 11 to be doing something else, or had no definite plans.

The Government of Ontario estimates (Ontario Statistics, 1981) that 14% of the appropriate age groups attend University and 11% attend some other form of postsecondary institution. These figures are very similar to those obtained by averaging the results for both Peel cohorts. The proportions of Peel students going on to various postsecondary institutions are similar to those in the Province as a whole.

Expectations and Reality

A major focus of the study was to compare respondents' current activity with their high school intentions. Effective programming, career counselling, and preparation in school relies on students' having some reasonable sense of what they might do after high school. All respondents were asked whether their current activity was what they had expected, while in grade 11, to be doing. Responses are shown in Table 4.

TABLE 2
LENGTH OF STAY WITH PRESENT EMPLOYER

	0-6 Months	7-12 Months	1-2 Years	More Than 2 Years
1977-78 (N=264)	29%	26%	22%	23%
1979-80 (N=215)	53%	30%	11%	6%

TABLE 3
EDUCATIONAL ACTIVITIES OF RESPONDENTS

	High School	College	University	Other	TOTAL
1977-78 % of Students (N=224)	1%	36%	62%	1%	100%
% of Respondents (N=549)	.5%	15%	25%	.5%	41%
1979-80 % of Students (N=283)	80%	16%	3%	1%	100%
% of Respondents (N=523)	42%	10%	1%	1%	54%

TABLE 4
ACTUAL AND EXPECTED ACTIVITIES

Current/Expected	Same Job or Course	Other Job	Other Course	Did Not Know
<u>1977</u>				
Work (N=291)	28%	23%	12%	37%
School (N=224)	54%	12%	16%	18%
University Students (N=137)	61%	8%	15%	16%
Total Cohort (N=527)	40%	17%	15%	16%
<u>1979</u>				
Work (N=202)	29%	29%	18%	24%
School (N=283)	81%	6%	4%	9%
Post-Secondary Students (N=59)	58%	12%	8%	23%
Total Cohort (N=509)	58%	17%	10%	15%

Those in postsecondary institutions are twice as likely as those working to be fulfilling their grade 11 plans. However, even many continuing students find themselves doing something completely unanticipated as little as two years previously (for the 1979 cohort). In other words, students' intentions are very frequently not borne out in practice. From these data, shown in Table 5, it is possible to infer the grade 11 intentions of all students.

TABLE 5
GRADE 11 INTENTIONS AND CURRENT ACTIVITY

	1977 (N=516)	1979 (N=501)
Intended to work	161 (31%)	137 (27%)
Working	134 (83%)	108 (80%)
Working at intended job	74 (46%)	52 (38%)
At school	26 (16%)	13 (10%)
Unemployed	1 (1%)	11 (8%)
Other	0 -	2 (2%)
Intended School	193 (37%)	277 (55%)
At school	155 (80%)	240 (87%)
Intended course	120 (62%)	231 (83%)
Working	36 (19%)	34 (12%)
Unemployed	2 (1%)	2 (1%)
Other	0 -	1 -
Intended Job Training	17 (3%)	14 (3%)
Job training	14 (82%)	10 (71%)
Working	3 (18%)	3 (22%)
At school	0 -	1 (7%)
Unemployed	0 -	0 -
Other	0 -	0 -
Did Not Know	145 (28%)	76 (15%)
Working	99 (68%)	43 (56%)
At school	40 (28%)	26 (34%)
Unemployed	5 (3%)	7 (9%)
Other	1 (1%)	0 -

Of those students who intended to be working, 80% are working, although usually in a different job than they had hoped. Of those who intended to continue their education, 80% are doing so. Again, however, many of these at the postsecondary level are in a different program than intended. Taken as a whole, the responses indicate that former students' short-term educational plans (i.e., to finish grade 13, or to enter a particular postsecondary program) are carried out reasonably often. However, plans related to work are carried out only in a minority of cases. Comparison of the planned and actual jobs of respondents shows that changes of plans are usually from those of a skilled or higher status job to an actual low skill, low status job (See Table 6).

TABLE 6
INTENDED AND ACTUAL JOBS

1977 Cohort		1979 Cohort	
Intended	Actual	Intended	Actual
Chef	Lathe Operator	Radio/TV	Shipper/Receiver
Social Worker	Travel Agent	Pilot	Material Handler
College Student	Truck Driver	Fashion Designer	Dry Cleaning Clerk
Pilot	Civil Technology	Travel Agent	Clerk
Veterinarian	Cake Decorator	Teacher	Retail Sales
Fashion Merchandising	Assembly Inspector	Tool and Dye Maker	Truck Driver
Architect	Cook	Accounting	Cashier
Pilot	Letter Carrier	Music Teacher	Secretary
Model	Drug Store Clerk	Funeral Director	Gas Cashier
Artist	Gas Attendant	Police Officer	Insurance Agent
Probation Officer	Accounting Clerk	Golfer	Sales Clerk
Hairdresser	Clerk	Social Worker	Clerk

Implications of the Study

The results of this first round of the study are currently under discussion by various staff members within the Peel Board of Education in terms of their implications for secondary schools in the district. There are a number of ways, not all of them described in this paper, in which the results are of importance locally.

The study has, however, a number of implications for secondary education and, more generally, for research; some of these are particularly noteworthy. Although these are initial results only, they are of sufficient significance to suggest they might be stated as implications to be refined and modified in concurrence with data from later rounds.

Students' postsecondary activities are not predictable at the level of the individual. Since school activities such as counselling and streaming are intended to be predictive for individuals, these findings are of crucial importance. Large numbers of students change their plans shortly after high school, especially those entering the work force.

Such a finding suggests that the schools ought to do less to help students make up their minds and more to assist them in being able to accommodate changes in plans as they occur. That is, the results point not to the need for more help in having students pick careers in high school, but to emphasizing the degree to which change can and will occur, and assisting students in planning for a variety of contingencies. Such an approach would take a major change in attitudes towards the counselling function in high schools.

At the same time, schools need to consider structural changes which will make it easier for students to change their minds—to reenter high school, to change track, to pick up additional courses, or to meet entrance requirements for different kinds of postsecondary education. This sort of programmatic flexibility could be of great assistance to students.

Students also need much more knowledge—experiential knowledge—about what work is like. It is apparent that many students have limited knowledge and very unrealistic ideas about what they will be able to do after high school. While the school ought not to discourage high expectations, it does have a responsibility to tell students about such matters as the actual composition of the labour force and the kinds of entry-level jobs which will likely be available to them. It does have a responsibility to inform them about the real possibilities for entry to apprenticeships or skilled trades. Such programs as cooperative education and work experience would seem to be a clear step in the right direction.

Finally, the early results of the study indicate the value of follow-up studies, especially if they can be made longitudinal. As the Peel study continues, a picture will emerge of the impact of education on school to work transitions, and of the relationship between students' high school plans and experiences and their lives years later. Such a picture may prove to be very humbling; at the same time, it cannot but be very informative.

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Characteristics of Learning Disabilities Persisting into Adolescence

A self-rating behavior checklist was administered to learning disabled and academically achieving adolescents. Items involving visual-spatial development, language and communication skills, memory and sequencing, social and emotional adjustment, and attentional skills differentiated between the two groups of students. The results have implications for identifying, educating, and counselling learning disabled adolescents.

Research concerning the nature of learning disabilities in adolescents is limited at the present time. Anderson (1970) compared the common themes that emerge from anecdotal records (one major source of data) of adolescents who have coped successfully with learning disabilities and those who have not. Anderson concluded that three factors emerge as characteristic of persons who have made a negative adaptation to their learning disability. First, there is an attitude of discouragement about learning. The adolescent sees himself either as mentally retarded or as a slow learner. This identification in itself is built around the hidden logic, "I cannot learn to read (or write, spell, or do arithmetic) so why try?" Second, the psychopathology which has evolved from the long history of failure supersedes and masks the basic learning disability. The character structure which emerges is often far more difficult to modify than the learning disability itself. Third, because the adolescent has developed a way of life which incorporates a concept of being unable to learn, remedial efforts toward alleviating the deficit are frequently defeated (Anderson, 1970, p. 69).

It would appear logical that in order to help children cope successfully with their learning disability, we must begin before the nature of the disability has become obscured by emotional overlay. The message is clear for those children who

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are currently entering the school system at the kindergarten level. Nevertheless, there are thousands of adolescents who are learning disabled and who are now struggling to cope with mastering the requirements of the school system. For these young people we must continue to strive to find answers. The present study was an attempt to determine how learning disabilities are manifested during adolescence.

Characteristics of Learning Disabled Adolescents

One of the conditions of a learning disability is that it persists past maturity (Kass, 1974) and is characterized by a persistence of chronicity (Rogan & Lukens, 1969). Longitudinal studies on severe reading disability indicate that the condition is best regarded as chronic, requiring long-term treatment (Balow & Blomquist, 1965; Silberberg & Silberberg, 1969).

Koppitz (1971), in a ten-year intensive investigation of 177 special-class students with severe learning disabilities, reported that at the end of five years only 30 children were able to return to regular class. The majority of the children, including those who returned to regular class, did not catch up in their work and their problems did not disappear. She concluded that there is an initial misleading spurt in achievement that arouses unwarranted optimism but that these early gains are often "washed out" in subsequent years.

Werner, Bierman and French (1971) reported on an impressive follow-up study of development and learning in which a cohort of more than 600 children and youth in Hawaii were followed from birth to 18 years; 88% of the original cohort were retained in the 18-year follow-up. Although of normal intelligence, approximately 3% of the original (1955) cohort were diagnosed in need of placement in a learning disability class at age 10 because of serious reading and communication learning disabilities, visual-motor impairment, hyperactivity, and difficulties in attention and concentration. Twenty percent of this group (the 3%) had physical evidence of "organicity" on pediatric-neurological examinations. For the overwhelming majority, serious problems persisted throughout adolescence. Agency records for 80% indicated continued academic underachievement confounded by absenteeism, truancy, and a high incidence of repetitive impulsive acting-out behavior. Rates of contact with community agencies were nine times as high for the experimental group as for the control subjects matched by age, sex, socioeconomic status, and ethnicity.

Group tests at age 18 showed continued perceptual-motor problems for most, as well as deficits in verbal skills and serious underachievement in reading and writing. Self-reports revealed a pervasive lack of self-assurance and interpersonal competency and a general inadequacy in utilization of intellectual resources on the Locus of Control Scale; the scores indicated the subjects did not feel their actions were under their own control. Other important highlights included:

1. Learning disabilities which persisted into young adulthood had strong biological and temperamental origins.
2. Although low SES increased the likelihood of learning disabilities, the combination of biological stress and environmental deprivations, especially family instability, led to greatest risk of subsequent serious and persistent learning disabilities in both lower and middle class children.
3. The quality of parent-child interaction played a pervasive role in the origins of learning disabilities, especially among unwed teenage mothers who are not

prepared physically, emotionally, or fiscally for adequately rearing their offspring.

4. The role of the father was quite crucial as a learning disabilities factor, especially as related to learning disabilities among sons and teenage pregnancies among daughters.
5. Major factors which contributed to the improvement of some learning disabilities included the youth's sense of competence and perceived internal locus of control as well as the ability to read and write standard English (Werner et al., 1971).

The question of how learning disabilities vary as a function of chronological age is a critical one because it has not been fully determined if characteristics commonly associated with learning disabilities at younger ages exist in adolescent populations. Rogan & Lukens (1969) stated that the disability may manifest itself in changing ways as the pupil matures and the school demands change. Clements (1966) listed, in order of prevalence, 10 differentiating characteristics of minimal brain dysfunctions in elementary school children: (1) hyperactivity, (2) perceptual-motor impairments, (3) emotional lability, (4) general coordination deficits, (5) disorders of attention, (6) impulsivity, (7) disorders of memory and thinking, (8) specific learning disabilities, (9) disorders of speech and hearing, and (10) equivocal neurological signs and encephalographic irregularities.

The literature indicates that learning disabled adolescents do not have a suppressed profile in all areas of functioning. Brutton, Richardson, and Magel (1973) stated that logical-reasoning and abstract-thinking skills do not develop as early in learning disabled pupils as they do in non-disabled students. Habertape (1976) noted that learning disabled students exhibit perseveration, disinhibition, and qualitatively different approaches to problem solving, while Deshler (1978) reported learning disabled adolescents may be deficient in the ability to organize information, deal with abstractions, questions, and evaluation of information. Stewart, Palkes, Miller, Young, and Welner (1974) reported several studies indicating that learning disabled children have lower than average IQs.

Hagin (1971) stated that the pervasive difficulty of the learning disabled student is an inadequacy in dealing with symbols which persists into adolescence. Hagin also concluded that learning disabled adolescents have difficulty with listening which interferes with social interactions, peer acceptance, job performance, and academic success. Deshler (1974) reported that these students performed poorly in blending tasks, spelling, grammar, and vocabulary skills. Myklebust (1973) found reading-disabled groups at 9, 11, 13, and 15 years were markedly deficient in output of written language, use of abstractions, the number of words available to them, and syntax, although the latter deficiency tended to lessen with age.

While perceptual and motor disabilities tend to improve with age, disabilities which still persist as significant during adolescence are fine and gross motor coordination problems (Siegel, 1974; Wilcox, 1970); handwriting difficulties involving illegibility, poor spacing, cramping, and laboriousness in writing (Deshler, 1974); clumsiness in physical education and disturbances in locomotor coordination (Myklebust, 1973); and perceptual irregularities.

Perceptual-motor correlates of learning disability also include hyperactivity, distractibility, poor attention, and lack of frustration tolerance. While the research is confusing and controversial, hyperactivity does not seem to disappear in

adolescence—in comparison to his peers, the adolescent remains more restless, distractible, impulsive, and emotionally unstable (Ross & Ross, 1976). According to Stewart (1976), it is possible that in adolescence, antisocial behavior appears for the first time in about one-fifth of hyperactive youth. The manifestations of hyperactivity, however, may change with age with a disappearance of “frantic-to-and-fro” purposeless motor activity and the appearance of subtler actions such as finger tapping, grimacing, or tics (Wilcox, 1970). Adolescent hyperactivity is of two types—distraction and attention lapses, or a paralysis of effort resulting in failure to concentrate (Wilcox, 1970).

Gordon (1970), Griffin (1971), Rosenthal (1973), and Silver (1974) have stressed that concomitant emotional and personality difficulties often are associated with learning disabilities in adolescents. Significant problems in social adjustment, social perception, self-concept, and motivation are often found. Socioeconomic and family variables also influence school achievement and related emotional and personality adjustments. Mauser (1974) reported negative self-concept and low frustration tolerance in learning disabled adolescents.

One of the most revealing and pernicious indicators of learning disability conditions during adolescence is the school dropout rate (Cervantes, 1965). Repeated academic failures affect the adolescent's personality. Among the social factors cited as significant are an aversive personality that repels rather than attracts people (Siegel, 1974) and a poor social perception, including factors such as an inability to generalize from one situation to another, oversensitivity to the reactions of others, difficulty in accurately interpreting both verbal and nonverbal moods and communications, and difficulty in determining the impact of one's actions on others. Repeated academic failure also leads frequently to a damaged self-concept and the development of defenses (Drake & Cavanaugh, 1970).

The Study

Research supports the hypothesis that adolescents with learning disabilities continue to manifest dysfunction characteristics and emotional maladjustment to a significant degree. Furthermore, the deficits occur in various combinations in different students. The situation is more serious for adolescents than for younger children. By the time children reach adolescence, classes are departmentalized and teachers may not have the opportunity to observe the characteristics of their many students. The problem is compounded because many students have become very adept at covering up problems by clowning around, withdrawing, and generally using failure-avoiding tactics. Even with the availability of resources required to assess adolescents with test batteries designed to detect learning disabilities, because the tests are generally not suited to, or normed on, adolescent populations, the tasks of assessment and educational programming are gigantic.

One large vocational high school in Alberta, designed for adolescents having academic and social adjustment difficulties, includes students who were diagnosed as learning disabled in the elementary school. An effort was made to assess the learning disabled students for instruction more suited to their needs.

Subjects

Three hundred thirty-one first year students in the vocational high school and 63 achieving grade 10 and 11 students in a regular high school were included. A review was made of the cumulative school records for each student and subjects

with IQ scores of more than 85 were selected. Because the students came from schools throughout the city and neighboring counties to the vocational high school, the IQ tests administered ranged from a number of group tests to the WISC-R. Therefore, no attempt was made to compute the mean IQ. All students were in the 15- to 17-year chronological age range.

Procedure

Students completed a self-report inventory (Whyte, Harder & Kirk, 1981). The inventory was devised by observing the students in the vocational high school perform tasks in both the vocational and academic classes and by reviewing the literature on social adjustment characteristics usually manifested by learning disabled adolescents. From these sources a list of questions was compiled and revised both in content and phrasing in a series of pilot studies.

The revised inventory was then administered in groups of 15 to 20, to students from both schools. The questions in the inventory were grouped in six major categories (Table 1). Students were directed to read the questions and respond on a scale of 1 to 3: (1) they seldom or never experienced the problem; (2) they sometimes experienced the problem, and (3) they almost always experienced the problem. A category (4) was also included where appropriate to designate that the activity had never been tried. Students were encouraged to ask questions if they could not read and/or understand the question. Two or three examiners were always present. The inventory took approximately 40 minutes to administer.

Statistical Analysis

Reliability for the inventory was determined by the test-retest procedure for a random sample of 60 subjects one month after the original administration. Items with correlation coefficients of 0.80 or more were retained for analysis. Responses for each item for both the vocational and academic high school students were compared and the Chi Square statistic were computed. One hundred fifty items discriminated between groups and were retained for the final analysis.

The average scale score for each area was determined by summarizing the scores recorded for each question in that area. For example, six items were retained in the area dealing with fine motor skills. A new scale from 1 to 5 was utilized to quantify the data: (1) 75% to 100% of the items were scored 1; (2) 50% were scored 1 and 50% were scored 2; (3) 75 to 100% of the items were scored 2; (4) 50% of the items were scored 2 and 50% were scored 3; (5) 75 to 100% of the items were scored 3. The summary scores for both groups for each area assessed were compared and the Chi Square statistic computed.

Results

The percent of dysfunction (D) and nondysfunction (ND) students at each point on the scale are presented in Table 2. Percentages are rounded off to the nearest whole number and the totals may not always total exactly 100%. Because categories 1 and 2 on the 5-point scale indicated students were reporting minimal or no problems in an area, the percentages were combined and considered equivalent to 1 on the original scale. Category 3 on the 5-point scale was interpreted to mean that students reported the problem present sometimes; these percentages are included in category II of Table 2. Categories 4 and 5 on the 5-point scale were combined because the percentages in category 5 were very low. The combined percentages are

included under III in the table and are interpreted to mean that the student is reporting a significant problem in the area.

TABLE 1
AREAS OF DYSFUNCTION ASSOCIATED WITH LEARNING
DISABILITIES IN ADOLESCENTS

I. SPATIAL DEVELOPMENT
1. balance and posture
2. laterality
3. spatial judgments
4. fine motor skills
5. ocular control
6. copying skills (visual-motor integration)
7. visual perception
II. LANGUAGE AND COMMUNICATION
1. reception
2. comprehension
3. expression
4. understanding of grammar and syntax
5. auditory discrimination of sounds
6. sound blending skills
III. MEMORY/SEQUENCING
1. memory
2. sequencing
IV. ATTENTION-RELATED DISORDERS
1. perseveration
2. distractibility/impulsivity
3. hyperactivity
4. emotional reaction to frustration
V. ADJUSTMENT
1. self-concept
2. perception of how others see them
3. attitude to school
VI. SENSORY FUNCTIONING
1. hearing
2. vision

Seven areas of spatial development were assessed. The majority of students in both groups did not report problems with balance and posture (91% and 98% for the D and ND groups, respectively). The Chi Square values are reported in Table 3. The differences reported for balance and posture between the two groups are not significant. The differences between the two groups for laterality were significant ($p<0.05$). While 79% of the D and 90% of the ND students reported no problems, 10% of the former and 2% of the latter students reported significant problems with laterality.

TABLE 2
PERCENTAGES OF DYSFUNCTION AND NONDYSFUNCTION
STUDENTS AT EACH POINT ON SCALE

	Scale ^a					
	I		II		III	
	DYS.	NONDYS.	DYS.	NONDYS.	DYS.	NONDYS.
I. Spatial Development:						
1. Balance	91	98	5	2	3	0
2. Laterality	79	90	11	8	10	2
3. Spatial Judgments	68	91	13	3	20	6
4. Fine Motor Skills	53	78	13	10	34	13
5. Ocular Control	72	87	12	5	16	8
6. Copying Skills	72	93	16	3	12	3
7. Visual Perception	81	100	9	0	10	0
II. Language and Communication:						
1. Reception	71	91	17	8	12	2
2. Comprehension	74	96	12	5	14	0
3. Expression	55	88	19	6	26	5
4. Grammar & Syntax	75	90	15	5	10	5
5. Discrimination	83	95	8	5	9	0
6. Sound Blending	55	76	19	11	26	13
III. Memory/Sequencing:						
1. Memory	57	90	21	2	22	8
2. Sequencing	69	90	14	5	18	5
IV. Attention Disorders:						
1. Perseveration	68	87	20	8	13	5
2. Distractibility/ Impulsivity	52	75	20	10	28	16
3. Hyperactivity	59	65	15	8	26	27
4. Frustration	63	87	9	0	27	13
V. Adjustment:						
1. Self-concept	67	86	15	3	18	11
2. Perception of Others	79	92	12	5	9	3
3. Attitude to School	89	100	7	0	5	0
VI. Sensory Functioning:						
1. Hearing	78	95	12	3	10	2
2. Vision	76	90	8	0	16	10

^a Scale: I - Problem seldom or never experienced
 II - Problem sometimes experienced
 III - Problem almost always experienced.

The two groups differed in their reported ability to make spatial judgments. Twenty percent of the D and 6% of the ND students reported significant problems in this ability. The differences were even more marked for fine motor skills: 34% of the D and 13% of the ND students reported significant problems ($p < 0.001$). Significant difficulties were reported by 16% of the D and 8% of the ND students for ocular control ($p < 0.05$).

Problems with copying skills, that is, the ability to write, reproduce figures, etc., were reported by 12% and 3% of the D and ND students, respectively ($p < 0.01$).

TABLE 3

CHI SQUARE COMPARISONS OF DYSFUNCTION AND NON-DYSFUNCTION
STUDENTS ON SIX CATEGORIES OF BEHAVIORS
ASSOCIATED WITH LEARNING DISABILITIES

Behavioral Areas	χ^2	d.f.	p
I. Spatial Development:			
balance and posture	4.233	2	---
laterality	5.927	2	*
spatial judgments	13.768	2	***
fine motor skills	13.969	2	***
ocular control	6.826	2	*
copying skills	12.954	2	**
visual perception	14.004	2	***
II. Language and Communication:			
reception	11.027	2	**
comprehension	14.688	2	**
expression	26.017	2	***
grammar and syntax	7.027	2	*
auditory discrimination	7.080	2	*
sound blending	10.668	2	**
III. Memory/Sequencing:			
memory	26.220	2	***
sequencing	12.639	2	***
IV. Attention Related Disorders:			
perseveration	9.615	2	**
distractibility/impulsivity	11.322	2	**
hyperactivity	2.305	2	---
emotional reaction and frustration	14.529	2	***
V. Adjustment:			
self concept	9.290	2	**
perception of how others see them	5.996	2	*
attitude to school	8.005	2	*
VI. Sensory Functioning			
hearing	10.461	2	**
vision	8.517	2	*

* $p < .05$ ** $p < .01$ *** $p < .001$

--- not significant

Finally, no ND student reported problems with visual perception and 81% of the D students did not report problems in this area, but 9% of the latter group reported a moderate problem and 10%, a significant problem ($p < 0.001$).

Chi Square values in the areas of receptive language, comprehension, and expressive language were very significant ($p < 0.01$). The percentages of D students reporting problems in the three areas were 12%, 14%, and 26% compared to 2%, 0% and 5% for the ND students.

Differences between the two groups in ability to understand grammar and syntax, and to discriminate auditorially were both significant ($p < 0.05$) with 10% and 9% of the D and 5% and 0% of ND groups reporting problems in the two areas, respectively. Interestingly, both groups reported sound blending as a significant problem quite frequently (26% of D and 13% of ND); however, only 55% of the D students compared to 76% of the ND students reported no problems in this skill and the differences were significant ($p < 0.01$).

Differences reported in both memory and sequencing abilities were very significant ($p < 0.01$). Twenty-one percent of D students reported moderate and 22% reported significant problems in memory, and 14% and 18% of this group also reported moderate and significant problems with sequencing. Ninety percent of the ND students reported memory and sequencing were not problems.

The disorders usually included in the literature on hyperactivity are perseveration, distractibility/impulsivity, hyperactivity, and extreme emotional reaction to frustration. Differences for three of these behaviors were found to be significant in the present study. Differences in hyperactivity per se were not found to be significant; however, this was because both groups reported significant problems in this area: 26% of D and 27% of ND students scored 3 on the questions describing hyperactivity and the percentages at the other two points on the scale were also very similar.

Twenty-eight percent of D and 16% of ND students also reported significant problems with distractibility/impulsivity; however, 75% of ND but only 52% of D students reported having no problems in this area. The differences were significant for both distractibility and emotional reaction to frustration ($p < 0.01$).

As reported previously in the literature review, emotional overlay appears to be the major disability among adolescents with learning disabilities. Three areas of functioning are usually implicated: negative self-concept, their perception of how they are viewed by others, particularly those in authority, and their attitude to school. The differences as determined by self-report of the D and ND students for these three areas were all statistically significant ($p < 0.05$); however, negative self-concept was the area most often reported and negative attitude to school was cited frequently.

Finally, personal clinical experience indicates that learning disabled students at all age levels seem to have a higher than average incidence of problems associated with sensory functioning. Twenty-two percent of the D students reported moderate to significant problems with hearing compared to 5% of the ND students ($p < 0.01$). Twenty-four percent of the D students reported moderate to significant problems with vision compared to 10% of the ND students ($p < 0.01$).

Discussion

The review of literature on the manifestations of learning disabilities during adolescence indicated that many of the characteristics of learning disabilities in children persist as significant problems into adolescence and adulthood. The present study offers support for this hypothesis.

Spatial deficits with the exception of balance and posture continue to interfere with the adolescent's functioning. The areas of most serious concern appear to be visual perception, fine motor skills in general, including the ability to write and to make judgments involving space. If the adolescent's perceptions of his spatial disabilities are accurate, there are serious implications. The majority of adolescents

with learning disabilities either elect or are counselled to enter vocational education, an educational stream loaded with potential for failure for individuals with spatial deficits. Furthermore, little has been done to investigate alternative teaching strategies in vocational education for children with these types of deficits. The area clearly is one where further research is essential.

The areas of language and communication deemed most serious by these adolescents involved listening, understanding or processing of visual and auditory information, and the ability to express themselves both vocally and manually. Sound blending was also considered an area of significant difficulty by 26% of these adolescents and of moderate difficulty by another 19%.

A review of the reading scores for these students reveals that many are functioning below the literacy level in reading. Reading material provided in shop classes is written above a grade six level. Remediation of reading relies heavily on a phonetic approach, including sound blending. Obviously, teaching strategies must be evolved which will first of all take into consideration the needs of the individual student, and secondly devise strategies in keeping with their pattern of strengths and deficits.

Forty-three percent of the dysfunction students reported moderate to severe disabilities in memory, while 32% reported problems in sequencing. If there is any one skill which separates the exceptional child from the achieving child, it is memory. Kirkbride (1980) compared the memory ability of achieving and learning disabled students at four age levels between 6 and 13 years of age and reported that the recall performance of learning disabled students at the 10- to 11-year age level lagged two years behind that of the achievers, while at the 12- to 13-year age level, the learning disabled students lagged four years behind the achievers in recall ability. However, when learning disabled students were taught to use verbal cues and grouping strategies for memory, the differences disappeared (Kirkbride, 1980). It is obvious that memory is involved in everything we do. It is equally obvious that learning disabled adolescents must be taught strategies to develop their memories.

The terms associated with the so-called syndrome of hyperactivity are often used imprecisely and synonymously; however, it is becoming more apparent that hyperactivity is not a single disability. Furthermore, those behaviors commonly associated with an increased activity level per se, for example, an increase in skeletal movement when the student should be quiet, are apparently found in both learning disabled and non-learning disabled students. However, on questions involving descriptions of perseverative, distractible/impulsive behaviors, and an intense reaction to frustration, the two groups do appear to be differentiated. Achieving students appear not to experience, or at least to cope more effectively, with these behaviors than do students with learning problems.

The behaviors described under attention disorders are probably also closely related to social/emotional adjustment. In combination with the other adjustment problems associated with learning disabilities in adolescents, it is little wonder emotional overlay problems take precedence over all other disabilities.

What are the implications of these findings? At the very least they indicate counselling is as important for these students as is instruction. Failure-avoiding tendencies must be overcome and a realistic and positive self-concept established, if these students are to become well adjusted and achieving adults.

Finally, the findings on sensory functioning may be indicating that many students are experiencing difficulty with vision and hearing. The need for adequate

diagnosis and correction, where possible, is essential. One wonders how many of these problems are going undetected.

Conclusions

In summary, the present study provides support for the hypothesis that learning disabilities do not disappear during adolescence. Indeed, they persist as significant problems, affecting academic achievement, vocational instruction, and social and emotional adjustment.

It also appears that self-reporting is a viable approach in diagnosing the specific nature of disabilities among adolescents. At the very least, continued research in this area should make it possible to identify students with learning disabilities in our school population and make the more expensive and time consuming psychological testing more effective and efficient.

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Supervising Student Teachers: A Means of Professional Renewal?

The professional growth occurring among teachers as a result of their association with the York Faculty of Education was assessed through a case study. Interviews and a questionnaire distributed to 325 teachers and principals in 31 schools were analysed to determine the occurrence of professional growth, the nature of that growth, and the factors contributing to it. The results support only in part the commonly held idea that association with a university teacher training program promotes professional growth. Only in those schools where some compatibility existed with the program at the university and where teachers felt involved in that program was evidence found for the occurrence of professional growth. The main source of influence was the student.

The need for teachers and others in various social institutions to engage in professional growth to keep pace with social change is well documented (Dobson & Dobson, 1978; Flanders, 1980; Howsam, 1976; McLaughlin & Marsh, 1978). Where programs of inservice education for teachers have been analysed, however, the results have been less than encouraging. In a paper presented to an OECD conference on inservice, Fullan (1980) argued that much of the current inservice activity is ineffective because the school environment is ignored, evaluation and follow up seldom occur, and conceptual planning is lacking. Agreement exists that the one shot workshop, although widespread, is almost totally ineffective in terms of assisting the professional development of teachers.¹

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Initiatives designed to redress the weaknesses in current inservice programs for teachers tend to focus on school based programs that provide continuous activity over time. Henderson (1979) argues that a school focus concentrating on problems identified at the school level and drawing on outside expertise combines the best aspects of course-based and school-based inservice activity.² Continuity over time has long been espoused as an important feature of inservice programming. The recent work of Joyce and his associates (Joyce, 1979; Joyce & Showers, 1980) has provided the main conceptualization of this notion. They argue that five training components—theory presentation, modeling, practice, feedback, and coaching—are required for teachers to learn and effectively apply new knowledge.

The resources necessary for initiating school-based inservice programs and/or the training models proposed by Joyce are simply not to be found in most school or university jurisdictions. Consequently, implementation of these ideas on any meaningful scale is highly unlikely in the near future.

Little consideration in the literature on inservice seems to have been devoted to those structures which are in place and which have promise for professional growth among teachers. One area that has the potential to provide those elements of school-focused inservice identified by Henderson (1979) and to provide continuity over time is the cooperating teachers' association with faculties of education during their supervision of student teachers. It has been assumed both by those in the schools and those in Faculties of Education³ that this association with students and university faculty will result in professional growth for teachers, but this claim remains largely unsupported. It would seem a useful contribution to the general literature on inservice, therefore, to study the association between a university and its cooperating teachers with the view to assessing the professional growth that occurs during the practicum and the conditions under which such growth can be maximized.

In this paper we assess the degree of professional growth occurring among teachers who worked with the Faculty of Education of York University supervising students during practice teaching. Three questions are addressed: (1) Is inservice activity and professional growth that can be attributed to the university seen to be occurring in the schools and among teachers? (2) What is the nature of that activity and growth? (3) What factors contribute to it?

Before turning to procedures and a reporting of results, we discuss related literature and outline the York teacher education program focusing on the roles of the adjunct professor and host teacher. In the final section, we discuss the results in terms of the questions and issues that direct the study.

Relationship to the Literature

The literature on inservice education, with its focus on proposals and arguments for new and more effective ways of retraining teachers, typically ignores the implementation of these programs. Consequently, such initiatives are likely to have little impact on what goes on in classrooms. We have argued that an alternate and potentially more useful route is to examine and seek to improve existing areas that provide opportunities for professional growth for teachers.

A small cluster of studies have focused on the role played by cooperating teachers in the supervision of student teachers during the practicum. In a recent review of research into teacher education in Canada, Holborn and Wideen (1983) identified 14 reports dealing with the cooperating teacher, of which several have

implications for this study.⁴ One consistent finding from these studies is that the role of the cooperating teacher is poorly defined and that, generally, teachers are unprepared for the task of supervision (Caldwell, 1979; Ratsoy, Babcock & Caldwell, 1978; Wideen, 1973; Holborn, 1978). Not surprisingly, then, teachers' reactions to various approaches used in assisting them to improve supervisory skills has been highly positive (Sloan, 1981; Holborn, 1978; Richards & Stinson, 1975).

The extent to which teachers learn new skills and gain new ideas from the university and are also able to implement them in classrooms remains something of an open question. For example, Marble (1981) summarized several studies conducted at Simon Fraser and reported that only parts of the model of clinical supervision used at that institution were being applied by the cooperating teachers. This was not the case, however, in a study carried out at Edmonton by Perfrement and Sigurdson (1978) who reported that teachers simply did not use clinical supervision even with extensive training. On the other hand, Martin, Isherwood and Rapagna (1978) found that regardless of the approach, training in supervision had a positive effect on teachers and the students they supervised.

What appears missing in these studies is an attempt to identify what professional growth occurs among teachers as a result of the programs sponsored by the university and equally important, what conditions are related to that growth. Another area not addressed in any of the studies we reviewed is the sources of influences upon teachers which appear most potent in terms of influencing their behavior. For example, it is not at all clear why Perfrement and Sigurdson report that the teachers in their study simply did not use clinical supervision while Martin and others found that training in supervision regardless of the approach was effective. While the activities sponsored by York University are not exactly the same as those discussed in this review, the results from our study will shed light on the same questions.

Indirectly the study should contribute to the growing literature on the problems of integrating theory and practice. Evidence exists to support the notion that this problem is one of the most serious in teacher education. The problem is exemplified by the different perspectives taken by those in the university and school communities as to each other's roles in preparing teachers. Those in the school may see faculties of education as being out of touch with the reality of public education, bound by intellectual theorizing and blissfully oblivious to the practical difficulties of classroom teaching. The university staff, on the other hand, may regard with some disdain what they consider the folklore and common knowledge of the classroom; the view is taken that instruction would be greatly improved if only what is known about teaching was actually implemented (Allen, 1976). It is the effective blend of these two cultures or stereotypes that should be the aim of teacher training programs.

The Setting

The establishment of York University in the 1950s and the planning for a faculty of education in the mid-sixties presented an opportunity for a new approach to teacher education in Ontario. Following a lengthy development period involving a thorough discussion and analysis of present teacher education, a model was implemented in 1972. The prime objective was to produce graduate teachers who were capable "both of working in emerging schools and of effecting change in schools" (Overing, 1973, p. 19). To this end, the faculty planners sought to redefine

their relationship with the schools; to enter with them into an active partnership in the profession. Under this scheme, it was hoped that inservice and preservice training would become natural extensions of each other and that the role of both cooperating and student teachers would radically alter. It would not be an exaggeration to say that the York program was undertaken with a definite sense of mission.

This sense of mission pervaded the teacher education program at York which was distinguished by four dominant characteristics. First, teacher education was seen to be a responsibility of the whole university where the majority of education faculty were cross appointments from within the university. Second, students were to co-register in two degree programs so that they pursued an academic degree and the professional B.Ed. simultaneously over a five-year period. Third, the curriculum of the B.Ed. program made extensive use of practicums, field experiences, and related seminars. The students spent one day a week in a school during the academic year culminating in a three- to five-week practicum; throughout this time they were associated with one particular host teacher. Fourth, the practicums and seminars involved the participation of selected school teachers who served as adjunct professors seconded to the university. These adjunct professors acted both as seminar leaders and supervisors of the student teachers' professional development.

In the development of their program, the planners at York saw the emergence of two roles vital to their conception of teacher education, namely that of the adjunct professor and the host teacher. It is these roles which provide the focus of the study. The *adjunct professors*, envisaged as a bridge between the university and the school, were successful teachers seconded to York for one-half day each week. In the school, they worked with the host teachers and carried out a weekly evaluation of students. They also engaged in a certain amount of professional development conducted in the school among the host teachers and students, thereby bringing the content and the theoretical input from the university to the school setting. On the York campus, adjunct professors worked with a faculty member in organizing and conducting seminars for students. The specific content of those seminars was based on joint input from the adjunct professor and the faculty person. The topic selection was also driven by the needs of students and issues raised by them.

One intention of the planners at York was to cooperate with schools that had a history of innovation and were amenable to change; therefore, the role of the *host teacher* was critical. Student teachers, called educational assistants, were assigned to a selected host teacher to serve as an apprentice for one day a week throughout the academic year for the full duration of their degree program. The expectation was that the student teachers would enter into a long-term association with the school and the host teacher, and that they would devise and implement an instructional program with a diagnostic, prescriptive, and evaluative emphasis. By emphasizing the collegial interaction of the student teacher and host teacher working together in a school that was attempting to modify its instructional program, the elements of inservice and preservice training could be merged. It was hoped that, while host teachers might lack sufficient skills to enable them to implement their ideas, interaction with the York program would aid them to acquire these skills.

It was within this context that this study, which focussed on the roles of the adjunct professor and host teacher, was conducted. While these roles were defined

in terms of the York program and as such are unique, the roles possess certain similarities to those of cooperating teachers in other faculties of education in Canada. The role of adjunct professor is not unlike that played by teachers seconded to universities for periods of one or two years. Host teachers as well do many of the things cooperating teachers do in supervising students during an extended practicum which is now a common practice in many Canadian universities.

Procedure

A case study approach was used in seeking answers to the questions identified in the introduction. The principal investigator spent two one-week periods at York and a research assistant conducted interviews over a similar period. Data were obtained through structured interviews and a questionnaire administered to principals, host teachers, and adjunct professors. Throughout the study, the process of triangulation was used to confirm perceptions emerging from different sources of data and different methodological techniques.

To determine whether professional growth among teachers and inservice activity in schools were occurring and to learn something of their nature (the first two questions raised by the study), a questionnaire was used, followed up by an interview. On the questionnaire, the respondents (host teacher, principals, and adjunct professors) were asked to note on a four-part scale the extent to which the operation of their classrooms and their methods of teaching had been influenced by the York Teacher Education program. In addition, an open-ended question asked the same groups to describe things they did differently as a result of their association with York. These data were followed up by interviews and classroom visits. Tape recordings of interviews were analysed to confirm the data collected from the questionnaire. Wherever possible, cross-checks were made by asking other teachers and principals to confirm information. The data from these sources were then matched against five criteria which are indicative of the presence of inservice activity and professional development. These criteria, outlined below, were drawn from the literature and from the general experience of those working in the area of inservice and were set out prior to the first field visit.

1. *Transactional activity.* Evidence should exist that traditional inservice activities such as workshops, reading and after-school programs are occurring.
2. *Perception of growth.* There should be a perception of growth and change in behaviour both among the individuals concerned and those who associate with them.
3. *Instructional and organizational change.* Evidence should exist that instructional and organizational changes in the classroom or workplace have in fact occurred.
4. *Less isolation among teachers.* There should be evidence that teachers were engaging in collegial exchange and planning and that the tendency to work in isolation was breaking down.
5. *Self-criticism.* Teachers should show evidence that they were becoming more critical of their own work.

To address the third question of the study, those factors related to professional growth and inservice had to be identified. It was assumed at the outset of the study that variation in terms of both inservice and professional growth would occur

among teachers associated with York. Initial contact with the schools and selected interviews confirmed this variability. Thus the questionnaire and interviews were structured to identify differences among them. These differences we discuss as factors related to professional growth and inservice.

Results

1. Does the York Teacher Training Program lead to inservice education activity and to professional development?

Cooperating teachers (adjunct professors and host teachers) were asked the extent to which their teaching (classroom operation and methods of teaching) had been influenced by their association with York. Principals responded to the same question but from the perspective of the teachers in their schools. The responses to this question, which are provided in Table 1, gave an indication of whether or not teachers perceived themselves as influenced by the York program. Considering only the aggregate data in Table 1, it can be seen that 56% of those responding reported a great deal or a moderate amount of influence and that only 13% reported not having been influenced. It can also be seen that differences in perception existed between the adjunct professor, host teacher, and principal; for example, 73% of the adjunct professors reported having been influenced moderately or a great deal, while only 51% of the host teachers responded in these two categories.

TABLE 1

RESULTS TO QUESTION B1 ASKING THE EXTENT OF INFLUENCE OF THE YORK TEACHER EDUCATION PROGRAM ON CLASSROOM OPERATION AND TEACHING METHODS^a

Subgroup	Response Scale				Total	
	A Great Deal	A Moderate Amount	Very Little	Not At All	%	N
Principal	12%	58%	24%	6%	9%	17
Adjunct Professor	8%	65%	28%	0	17%	29
Host Teacher	8%	43%	33%	13%	74%	128
Total % (N)	8% (14)	48% (84)	31% (54)	13% (22)	100%	174

^aThe data in this, and other tables are based on a 56% return of the questionnaire administered to 325 teachers and principals in 31 schools.

In a question soliciting written comments, teachers were asked if they could describe anything specific that they did differently in their classrooms as a result of association with York. These comments were categorized and are reported in the first column in Figure 1. Those teachers and principals who were interviewed were asked if there had been benefits in associating with York and, if so, what they had been. The responses to this question, which were categorized from transcribed interviews, are reported in Figure 1, column II. When the results from these two categories are considered with the criteria cited previously, a number of relationships become evident, as can be seen in the figure.

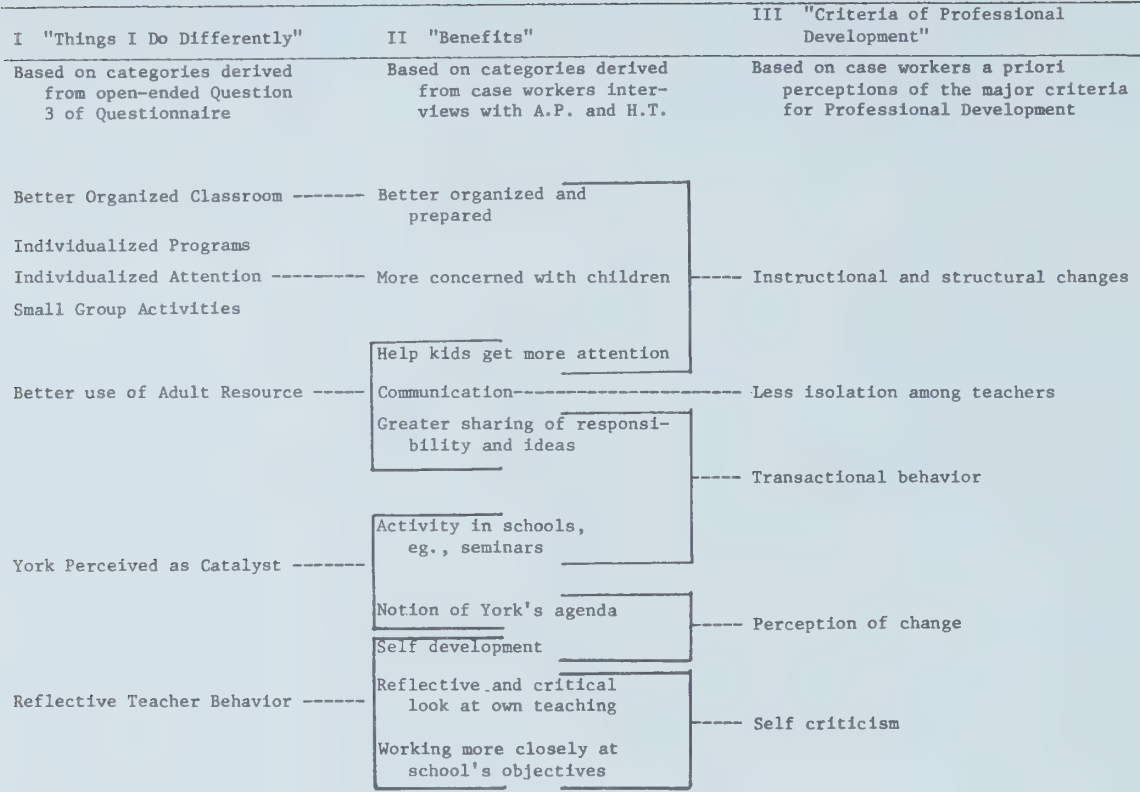


Figure 1. Relationships between teacher's perceptions and the criteria for professional development.

For example, the three categories of open ended responses, individualized programs, individualized instruction, and small group activity, which fell under *things I do differently* in column I, all involved individual differences. As a group they were related to the category, *more concerned with children*, under *benefits* in column II. These matched the professional development criterion of instructional and structural change in column III. Thus, the three columns in Figure 1 demonstrate the interrelationships between the responses that emerged from the different data and their relationship to the criteria. It is the relationship between the categories in columns I and II and the criteria listed in column III, coupled with the results described earlier in Table 1, that is the basis for the general claim that inservice activity and professional development which could be linked to York did in fact occur in the perception of teachers and principals.

2. What was the nature of the professional development?

To obtain an indication of the nature of professional development, host teachers and adjunct professors were asked their level of agreement on eight types of influence which were identified during the pilot interviews. The percentage results of these eight items for the total group, adjunct professor and host teacher are provided in Table 2.

It can be seen that considerable variation occurred for the different sources of influence. Two categories in particular, observing individual differences and responding to individual differences, carried a noticeably high level of agreement. This finding is significant insofar as it matches the York faculty's emphasis on the individual needs of children. This match is particularly interesting in the light of other information (discussed later) which emerged during interviews where teachers seemed unaware of any particular philosophical emphasis on the part of York. The

high level of disagreement for the item, *staff relations changing*, was also of significance considering that the faculty at York considered this a likely outcome of their model. As noted in the discussion of the results shown in Table 1, differences in perception between the host teachers are in evidence; for example, for the first item *modifying instructional goals*, 28% of the adjunct professors agreed that they had been influenced while only 13% of the host teachers expressed that view. On all but one of the items, the adjunct professors indicated a higher level of agreement. The exception was in responding to individual differences.

TABLE 2
LEVEL OF AGREEMENT GIVEN BY ADJUNCT PROFESSORS
AND HOST TEACHERS TO DIFFERENT SOURCES OF INFLUENCE

Types of Influence	Response Scale									Number Responding		
	Agree			Neutral			Disagree			Total	AP	HT
	AP	HT	Total	AP	HT	Total	AP	HT	Total			
Modifying Instructional Goals	28*	13**	17***	34	28	29	38	59	54	127	29	98
Modifying Teaching Methods	32	25	27	36	25	27	37	50	46	128	28	100
Observing Individual Differences	86	66	71	4	10	9	11	24	20	126	28	98
Responding to Individual Differences	52	59	57	32	13	17	16	28	26	129	25	104
Changing of Staff Relations	32	19	15	22	15	17	46	25	26	125	28	97
Work More Challenging	42	36	36	26	28	27	32	36	37	128	29	99
Work More Satisfying	33	43	41	48	38	34	19	27	25	120	27	103
Make Better Use of Resources	58	41	44	21	28	28	21	33	31	131	29	103

Note. HT = Host Teacher AP = Adjunct Professor

* 28% of the 29 APs responding
** 13% of the 98 HTs responding
*** 17% of the total number of 127 responding

3. What factors maximize inservice activity and professional development?

As indicated earlier it was apparent from the outset that some teachers and some schools had been influenced by their association with York and others had not. Our initial perceptions were confirmed by the first item on the questionnaire which asked specifically about the influence of York. The responses in each school were aggregated for this item, the schools ranked on this basis, and the data reexamined in order to identify factors related to the difference in influence. From this analysis, three factors emerged which appeared to maximize the effects of York’s programs—involvement, compatibility, and the influence of students.

Involvement, defined as participation in York’s activities, was a factor both for individual teachers and for schools. Those who spoke of having been influenced by

York's program or who could provide examples which exemplified that influence were those who had a record of participation in activity associated with York. In the case of individual teachers, the distinction was seen most clearly when the roles of the adjunct professor and the host teacher were contrasted. As earlier described, the adjunct professor's role carried with it much greater involvement than that of the host teacher. However, as shown in Table 1, the adjunct professors reported having been influenced to a greater extent and expressed a higher level of agreement on six of the eight types of influences shown in Table 2.

The second factor related to the occurrence of inservice activity and professional growth was that of compatibility. As we inquired into the notion of compatibility it became evident that roughly three groups of schools existed with regards to the staffs' perceptions of York's concept of teacher education—those school staffs who were in agreement with York's mission, those who were not, and those who saw York as just another Ontario teacher's college. It was quite evident from our interviews that it was within the first group—those schools in which staffs were attuned to York's mission—that the most inservice activity and professional growth were occurring. Much less professional growth or inservice activity could be identified in the other two groups of schools. While these two factors, compatibility and involvement, were related, it was clearly evident that they were separate particularly in the two groups of schools whose staffs were either attuned to York's mission or opposed to it.

Another factor highly related to inservice activity and professional development was the source itself. In early interviews it became evident that York's association with the schools came about through the complex interaction of roles played by different actors. Each represented a potentially different source of influence. Six sources (York students, peer interaction, principal, self-examination, the York staff, and the adjunct professor) were identified on the questionnaire; both the adjunct professor and the host teacher were asked to select a level of importance for each. Eighty per cent of the adjunct professors and 68% of the host teachers identified the presence of York students in their classroom as being the most important source of York's influence upon them. The next most important influence was self-examination reported by 56% and 63% of the adjunct professors and host teachers, respectively. The principal and the York staff were identified as the least influential of the six sources by the adjunct professor and host teacher respectively.

Discussion

A common notion about student teaching held by those in faculties of education and in school districts is that teachers who supervise students grow professionally. The data from this study do not support that commonly held belief. What they do support is the notion that teachers who are involved in a faculty's program and whose view of education is compatible with that of the faculty do grow professionally. To others, the task of student supervision is just that—a task to be carried out. If professional development is to be a by-product of student supervision, then both schools and faculties of education, on that basis, must provide opportunities for teachers to become fully involved as active partners based on a mutual understanding of goals.

The main influence perceived by teachers to have resulted from their association with York involved observing and responding to individual differences. It is noteworthy that prior to and during the time of the study, the faculty at York

perceived the recognition of individual differences as being an important component of effective teaching. Such data suggest, then, that not only can faculties of education encourage professional growth, but that they can influence the direction of that growth. However, influence upon teachers is a complex process and not an automatic one. We saw several schools in which virtually no inservice activity attributable to York could be identified. One of the factors differentiating the two groups of schools was the compatibility between the schools' orientation and that of York.

The notion of compatibility as a factor related to effective influence raises questions about the practice in most faculties of education whereby students are confronted with a bewildering array of alternatives from which they are to somehow make up their minds as to what constitutes effective practice. York, on the other hand, espoused a distinct idea of practice which was reflected in the selection of co-operating schools, the focus of seminars, the provision of materials, and the legitimization of practice. Consequently, students entered the schools with a fairly clear perception of what (in York's terms) constituted good education. In those schools where the staff's view of education was compatible with that at York, the students found a receptive climate; it was probably no coincidence that it was in those schools that most inservice was seen to be occurring and from which most professional development was reported. As a corollary, it is questionable whether the stance taken by most other faculties of education enables them to be influential in producing professional growth.

The finding that students represent a very strong influence upon teachers was quite clearly demonstrated in this study and has been supported by data collected at Simon Fraser University (Terry, 1980) where 65% of a sample of teachers, when asked how association with that university had influenced their professional development, identified student teachers as the main source of influence. Apparently, the influence of the students caused self-analysis as well as a clarification and stimulation of ideas. The finding of a strong student influence is not surprising in itself. The fact that the influence of students was seen to be greater than that of the principal or the faculty members is surprising and perhaps somewhat disconcerting.

One might attribute such influence to the constant presence of students in the classroom. However, the lack of threat posed by a student as distinct from a principal or university person should also be considered as an explanation of the finding. One might also speculate that such a finding simply underlines the isolation, loneliness, and intensity of the teaching workplace. Other potential sources of influence such as the principal, a peer, or a university supervisor simply do not penetrate the day to day activity in which a teacher must engage. The student, on the other hand, does.

Certainly, the two cultures to which we referred earlier with respect to theory and practice were alive and well at York, at least on the surface. But there was ample evidence to suggest that just as the practice of the school was being modified by the theory of the university, the reverse was also true, and that York's ideas were also being modified and adapted. This led us to the hypothesis that a hidden curriculum was operating at York and was exercising a substantial influence on many of the schools. It was working through a vector of forces—the most powerful of which was the student—to cause teachers to look more closely at what they were doing and to implement certain practices such as individualized instruction. As

such, the problem of theory and practice was being addressed, albeit in a rather indirect and subtle way. Thus the data from this study suggest that the type of school-based teacher education program typified by York has been somewhat more effective in providing an adequate blend of theory and practice than have other programs.

The conclusion to which one is drawn by the results of this study is that the model of teacher education operating at York provides impetus for professional development among many of the teachers associated with it. For others, it clearly provides very little except the added burden of having student teachers. The conditions had to be right: teachers had to be involved and have a stake in the program; the theoretical message had to be consistent and the atmosphere of the school receptive to that message; and the sources of influence had to be close to the action. Contrast this ideal scenario with a typical student teacher practicum where schools are often picked out of expediency, where no activity is planned to aid the supervising teacher, where meaningful contact with the university is minimal, and where the students leave the university confused by a plethora of ideas, none of which have been explored in depth. The message is clear. If teacher training institutions are to provide professional growth for those in the schools upon whom they depend to supervise their students, a great deal more thought and planning must go into the working relationship between the typical university faculty of education and the school.

Notes

1. The reader is referred to the work of Joyce and Showers (1980) and Joyce (1979), a review by Young (1979), and a review by Wideen (1980).
2. Henderson's position has been echoed and further developed by several writers. See in particular, Fullan (1980) and Nur and Weil (1978).
3. The authors have analysed the comments of school district persons and faculty members who discuss student teaching. A theme in these discussions, and indeed a rationale for district cooperation, is the notion that teachers will benefit professionally from the experience of supervising a student.
4. This review (Holborn & Wideen, 1983) is one of a four-volume report on a study of teacher education conducted in Anglophone Canada. Copies of the full report are available at a cost of \$10.00 from M. Wideen, Simon Fraser University, Faculty of Education, Burnaby, B.C. V5A 1S6.

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The Link Between Universities and Employment in Alberta

The study has four major thrusts: first, it presents university supply/labor market demand imbalances for Alberta between 1975 and 1980; second, there is a comparison of graduate starting salaries between 1970 and 1980 in a sample of occupations, the salaries are also expressed as a ratio to average industrial earnings; third, enrolment shifts and applications are used as a measure of student responsive supply behavior; fourth, there is an adaptation of a sociological model, the world systems model, to explain labor market changes as one manifestation of general societal change in the late twentieth century. The findings reveal that during the time frame of the study there were large graduate shortages in many areas of specialization. The economic returns from a university education do not appear to be rapidly declining although students tend to be responding to the market through shifting enrolments and choices of field of study. The world systems model demonstrates much promise as a sociological tool for explaining social change.

Increasing attention is being focused on the role of the university in Canadian society. The Senate of the University of Alberta, following in the footsteps of other Canadian institutions, recently published *The Report of the Commission on University Purpose* (1982). The social climate of the times seems to be providing the impetus for this current focus. The rapid, almost uncontrolled expansion of the higher education system is long past and the steadily increasing output of graduates from the universities during the 1970 decade has created new problems and concerns.

As long as universities in Canada remained elite institutions with a limited number of graduates entering a growing economy, employability was almost universal for graduates of all faculties. With the onset of the mass education philosophy in the late 1960s, there was a cumulative effect of larger graduating

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classes. The latter, coupled with world recessionary trends in the 1970s, produced an anomaly—graduate unemployment. With the university no longer providing the ticket to guaranteed employment, the public began to question the purpose of the institution.

The debate about the role of the university is not new. For many years, proponents have touted the comparative benefits of a liberal arts education over more specialized, job-oriented programs in the university; that is, the cultural rewards of education versus the economic ones. The debate, however, has become less philosophical and more pragmatic. There is increasing public and governmental pressure on universities to become more responsive to the labor market. This pressure is intensified by the fact that it is the liberal arts graduates who are frequently in lowest demand in the labor market (Harvey, 1974, p. 149). It is easier to argue for the cultural benefits of a liberal arts degree when it is also a marketable commodity. However, the latter, rather than cultural benefits, may be the prime motivation for many students.

Although research in the area has been undertaken, the actual state of the labor market for university graduates has been more often an area of speculation than one of systematic study. Frequently repeated statements include: "Many university graduates are currently unemployed," "It is easier for technical institute graduates to find employment than it is university graduates," "There are declining financial returns from a university degree." Very few objective analyses are available to determine if these statements are based on fact. In a recessionary economy, it is important to look at the comparative position of graduates relative to other labor force entrants rather than at the isolated experiences of graduates today or fifteen years ago.

Public and governmental pressure seems to be suggesting that universities ought to be more responsive to labor market demand. Little is said about how institutions can achieve that goal. Presumably, the universities would have to make an effort to control enrolments to match the appropriate numbers of graduates in each area of specialization to projected labor market demand at the time of graduation three to ten years down the road. A more appropriate question might be, "*Can* the universities be more responsive to the labor market?" That is, do current methodology and social conditions permit accurate supply/demand predictions? Whether or not such a goal is desirable is a value judgment beyond the scope of this paper.

Recently completed research into the university education/employment relationship in Alberta is designed to explore systematically many of the above concerns. In addition, some comparisons with the graduate situation in the remainder of Canada are made. The areas investigated include job opportunities, wages, and student responsive supply behavior. A sociological theory of social change, the world systems model, is adopted as an explanation of labor market changes in the twentieth century.

Design of the Study

The first thrust of the research is to measure, over time, the supply of university graduates from Alberta universities and to relate this supply to demand in the Alberta labor market for specific areas of specialization. In short, the purpose is to quantify labor market shortages or surpluses for university graduates in particular disciplines between 1975 and 1980. The intent of such supply/demand imbalances,

coupled with the growth in the managerial, professional and administrative segment of the labor force, is to determine the estimated job opportunities for graduates. Is it true that graduates have increased beyond the capacity for labor market absorption?

Actual and projected enrolments and graduations from Alberta universities constitute the supply (graduate imports are excluded). The Canadian Occupational Forecasting Program, COFOR (Canada Department of Employment and Immigration) is used as an estimate of demand. Regional variations in the model are prepared by Regional Economic Services of Employment and Immigration in conjunction with provincial government personnel. Two forecasts are used in this study, one prepared by Alberta Advanced Education and Manpower (COFOR, March, 1976) and a later one produced by Regional Economic Services (Canada Employment and Immigration, 1981). Both are estimates based on employment projections for 69 industries. Forecasts of industrial output, employment levels, and specific occupational requirements are linked to a medium term economic forecast for Canada with regional economic variations built into provincial forecasts. The estimates include net job creation and probable attrition through death and withdrawal for 496 occupational groups. Only those occupational groups which generally demand a university degree are segregated for this supply/demand study.

A second feature of the present research is the examination of starting salaries during the 1970 decade for a sample of occupations which require a degree. Does "wage-competition theory" (Thurow, 1979, p. 325) explain salaries paid to graduates? The theory posits that people with a particular package of skills compete in the marketplace with one another for wages which tend to rise or fall as skill shortages or skill surpluses become apparent. Wages are held to encourage or discourage individuals from seeking a particular skill package and as a result the labor market for each skill is kept close to balanced. Some researchers suggest that an increasing supply of university graduates, such as that which occurred in the last decade, would have the overall effect of reducing the salaries that employers are obliged to pay (Statistics Canada, 1978c). This thesis that there are declining economic returns from a university education is tested by comparing starting salaries of graduates from a sample of occupations between 1970 and 1980 with average industrial wages (industrial composite) during the same period. That is, a ratio of starting salaries for specific university graduates to average industrial wages over time is presented.

A third objective of this research is to determine if there is some evidence, in the form of altered enrolments, applications, or shifting faculty choices, of responsive supply behavior on the part of potential university students. This is an analysis of reciprocal or feedback aspects of the university education and employment interface which will ultimately have an impact on institutional policy.

A fourth and final thrust of the present study is the adaptation of a sociological tool, the world systems model, to provide an overall theoretical framework for explaining the social changes that have altered the university education/labor market relationship over the past few years. It is suggested that factors affecting the relationship between a university education and the labor market are best understood as smaller manifestations of global processes. That is, much of what is occurring in the Canadian labor market, for example, can be causally connected to the historical and economic circumstances of the world, its nations, and the regions within nations.

TABLE 1
AVERAGE YEARLY ALBERTA SUPPLY AND DEMAND FOR MAJOR GROUPS
OF MANAGERIAL AND PROFESSIONAL OCCUPATIONS, 1974-1979

CCDO Code	Occupational Categories	1	2	3	4	5	6	7	8	9
		Employment		Total Expansion Demand (2 - 1)	Total Replacement Demand [Deaths] [Withdrawals] 1975-1979 ^b	Total 1979 (3 + 4)	Demand Percentage of 1975 (5 ÷ 1)	Yearly Average	Supply Yearly Average ^c	Yearly Average Supply- Demand Imbalance (8 - 7)
		COFOR ^a 1975	COFOR ^b 1979							
11	Managerial Administrative	32,030	48,595	16,565	5,949	22,514	70.29	5,629	1,036	-4,593
21	Natural Science Engineering Mathematics	23,612	40,265	16,653	3,070	19,723	83.52	4,931	1,004	-3,927
23	Social Sciences	7,131	9,590	2,459	962	3,421	49.97	855	597	- 258
25	Religion	1,847	2,040	193	363	556	30.10	139	22	- 117
27	Teaching	30,996	44,330	13,334	4,273	17,607	56.80	4,402	1,859	-2,543
31	Medicine and Health	36,614	44,005	7,391	4,636	12,027	32.85	3,007	491	-2,516
33	Arts and Recreation	6,033	9,405	3,372	654	4,026	66.73	1,007	151	- 856
TOTAL ALL CATEGORIES		138,263	198,230	59,967	19,917	79,874		19,970	5,160	-14,810

Sources of Data:
^aAlberta Advanced Education and Manpower, Planning Secretariat, Summary of Canadian Occupational Forecast (COFOR) Model Results for Alberta 1975-1982. (Edmonton: March, 1976)
^bCanada Employment and Immigration, Occupational Requirements to 1985: Canadian Occupational Forecasting Program (COFOR). (Ottawa: January, 1981)
^cStatistics Canada, Universities: Enrolments and Degrees. Catalogue No. 81-204, 1975-1979. Graduates available to the labor force plus reserve re-entrants.

Findings and Conclusions

The supply-demand analysis for Alberta produced some extensive supply shortages for the major groups of managerial-professional occupations segregated in the *Canadian Classification and Dictionary of Occupations* (1971). After attrition in supply (a fairly predictable number do not, for various reasons, seek employment in Alberta within one month of graduation), there were shortages in the following seven major groups of managerial professional occupations: managerial, administrative; natural sciences, engineering and mathematics; social sciences; religion; teaching; medicine and health; arts and recreation. In all of the former groups, provincial graduate supply was inadequate to meet Alberta demand between 1975 and 1979. In a sample of fourteen individual occupations, there were four in which there was a surplus of graduates (See Tables 1 and 2).

The data point out the extent to which graduate imports to Alberta filled manpower vacancies between 1975 and 1980. Employment in managerial, professional and administrative occupations in Alberta grew from 161,000 in 1975 to 219,000 at year end 1979 (Statistics Canada, 1975-1979d). This increase far exceeds the total degrees granted (37,501) in Alberta over the same period of time (Statistics Canada, 1975-1979d). While some of the managerial, professional, and administrative occupations are filled by non-degree holders, the vast majority of recently filled positions carry degree prerequisites. Moreover, related literature indicates that roughly 30 percent of graduate output does not move into managerial/professional type jobs (Statistics Canada, 1981). With a retention rate of 63 percent, approximately 23,600 Alberta degree graduates were potential competitors for 58,000 Alberta managerial, professional, and administrative positions between 1975 and 1979. With the possible movement of roughly 30 percent of the graduates into sales and other nonprofessional/managerial/administrative occupations, the potential number of Alberta competitors is further reduced to approximately 16,500 (See Table 3).

The growth in the appropriate segment of the labor force suggests a number of job opportunities for highly qualified applicants in Alberta in the time period segregated. It also illustrates the mobility of university graduates in Canada. Unemployment among university graduates in the province remained consistently low at between two and three percent, often one-third as high as general unemployment. In addition, unemployment rates for university graduates were consistently below those of college graduates and others with less training (Statistics Canada, 1975-1980b). University graduates were more marketable than other labor force entrants in Alberta and Canada. The large migration to the province suggests that employment opportunities were competitive with those elsewhere in Canada. Alberta had a higher rate of absorption for more highly qualified manpower than for any other segment of the labor force (Statistics Canada, 1975-1979b). Although a university degree did not guarantee employment, labor force entrants were still better off with a degree than without.

The results of the data on salaries of university graduates (although the sample of five occupations was too small to generalize conclusions) showed little support for the thesis that an increasing supply of university graduates was reducing the salaries that employers are obliged to pay. Starting salaries for the five occupations, relative to average industrial wages in Alberta, did not show a consistent drop over the decade. Both the industrial composite and the graduate starting salaries increased with some specialization variation (See Table 4). Also, there was little

support for wage competition theory. That is, wages do not always appear to rise and fall as skill shortages or skill surpluses became apparent. Nor do low wages in a field consistently discourage potential students from entering that specialization. Finally, fields with the greatest shortages do not necessarily pay the highest starting wages in the labor market. In summary, it would appear that many factors including unions, professional associations, traditions of wage differentials, training costs, and technical progress all influence the wage associated with each job (Thurow, 1979, p. 330).

TABLE 2
AVERAGE YEARLY ALBERTA OCCUPATIONAL SUPPLY AND DEMAND
FOR SELECTED OCCUPATIONS, 1975-1979

CCDO Code	Occupations	1	2	Average Yearly Supply-Demand Imbalance 1975-1979 (2 - 1)
		Requirements ^a Average Yearly Demand 1975-1979	Supply ^b Average Yearly Degree Output With Appropriate Specialization	
1171	Accountants Auditors Financial Officers	915	407	-508
2111	Chemists	38	34	- 4
2112	Geologists	196	65	-131
2113	Physicists	3	27	+ 24
2142- 2154	All Engineers	449	292	-157
2181	Mathematicians Statisticians Actuaries	16	41	+ 25
2183	Systems Analysts Computer Programmers Related Occupations	112	52	- 60
2311	Economists	24	70	+ 39
2313	Sociologists	1	35	+ 34
2341- 2343	Judges Lawyers	184	103	- 81 ^c
3111	Physicians and Surgeons	410	175	-235 ^c
3113	Dentists	111	29	- 82 ^c
3151	Pharmacists	88	57	- 31
3352	Writers and Editors Publication	103	44	- 59

^aCOFOR 1975-1982, averaged yearly.

^bSupply is degree output subject to .63 retention ratio. Between 1970 and 1980, approximately 37% of Alberta university graduates were not seeking employment in Alberta one month after graduation.

^cLikely to be a slightly overstated shortage because of a probable lower attrition rate from graduation to the labor force.

TABLE 3

ANNUAL GROWTH OF EMPLOYMENT IN MANAGERIAL, PROFESSIONAL
AND TECHNICAL OCCUPATIONS AND LABOR FORCE ENTRANTS WITH
POSTSECONDARY EDUCATION, CANADA AND ALBERTA

Year	1		2		3		4		5		6	
	Employment in Managerial, Professional Administrative Occupations		Annual Increase		Annual % Increase in Employment ($\frac{2}{1} \times 100$)		Number of Labor Force Entrants with University Degree		Annual % Increase of Labor Force Entrants with University Degree		Annual % Increase of Labor Force Entrants with Postsecondary Graduation	
	Can. (000's)	Alta. (000's)	Can.	Alta.	Can.	Alta.	Can.	Alta.	Can.	Alta.	Can.	Alta.
1975	2008	161	-	-	-	-	n/a	n/a	-	-	-	-
1976	2095	176	87	15	4.3	9.3	45	17	4.9	21.8	-4.3	1.0
1977	2161	183	66	7	3.2	4.0	58	2	6.0	2.1	2.4	3.5
1978	2255	215	94	32	4.4	17.5	54	13	5.3	13.4	4.4	5.3
1979	2373	219	116	4	5.1	1.9	73	6	6.8	5.5	1.4	2.7
1980	2440	231	67	12	2.8	5.5	75	2	6.5	1.7	6.1	6.6
Annual Average Over 5 Years	-	-	86	14	4.0	7.6	61	8	5.9	8.9	2.0	3.8

Sources:
Statistics Canada, The Labor Force, Catalogue #71-001. Annual averages 1975-1980.
Statistics Canada, Out of School -- Into the Labor Force, Catalogue #81-570E, p. 155.

TABLE 4

RATIO OF ANNUAL STARTING SALARIES^a IN INDUSTRY
FOR FIVE OCCUPATIONS TO AVERAGE EARNINGS IN INDUSTRY^b
CANADA, EDMONTON, 1970-1980

	Engineer		Computer Systems Administrator		Financial Administrator		Physical Scientist		Economist Statistician	
	Canada	Edmonton	Canada	Edmonton	Canada	Edmonton	Canada	Edmonton	Canada	Edmonton
1970	1.32	1.33	1.30	1.43	1.35	1.39	n/a	n/a	1.31	n/a
1971	1.26	1.33	1.30	1.45	1.36	1.48	n/a	n/a	1.60	n/a
1972	1.22	1.27	1.28	1.62	1.48	1.43	n/a	n/a	1.56	n/a
1973	1.18	1.21	1.24	1.16	1.36	1.39	n/a	n/a	1.48	n/a
1974	1.17	1.22	1.24	1.18	1.41	1.43	1.36	n/a	1.53	1.66
1975	1.23	1.27	1.21	1.05	1.39	1.35	1.38	n/a	1.55	1.79
1976	1.20	1.22	1.20	1.17	1.35	1.47	1.34	n/a	1.54	1.85
1977	1.18	1.17	1.19	1.10	1.32	1.41	1.29	n/a	1.48	1.62
1978	1.18	1.25	1.19	1.24	1.38	1.49	1.38	1.37	1.49	n/a
1979	1.18	1.20	1.20	1.18	1.38	1.31	1.38	n/a	1.41	n/a
1980	1.22	1.22	1.22	1.14	1.38	1.34	1.42	n/a	1.41	n/a

Sources:
^aPay Research Bureau, Canada Public Service Staff Relations Board. Data compiled from computer tapes made available by N. B. Allen, Project Coordinator, Ottawa, 1981. Salary rate measures are surveyed every August, except for 1970 when they were surveyed in October.
^bAverage weekly earnings (Industrial Composite) X 52. Statistics Canada, Employment and Hours, Catalogue No. 72-002.

* Mean starting salaries + average earnings in industry.

Related literature does suggest that starting salaries in some fields of specialization may be deteriorating relative to general wages. Anticipated recruiting rates of pay for general arts (not honors) graduates in *Canada* did deteriorate between 1975 and 1980 relative to average earnings in industry (Pay Research Bureau, 1975-1980). In many other faculties, however, relative wages improved or remained the same. In summary, there is no consistent trend.

Two additional factors are important when discussing graduate starting salaries. First, starting wages may carry less weight with students than potential wages ten years hence. Second, research indicates that *average* salaries for graduates tend to increase as levels of education increase (Statistics Canada, 1981, p. 251). That is, Ph.D. graduates generally earn higher salaries than Master's graduates. It is also true that university graduate wages are, on the average, higher than college graduates. While some university graduates may be earning salaries below their expectations, most are still comparatively better off than non-university labor force entrants. The findings exclude educational costs and foregone earnings.

The third objective of the study was to examine evidence that would indicate responsive supply behavior on the part of students. Freeman concluded that "there is a substantial and growing body of evidence that young persons . . . are highly sensitive in their educational and career decisions to the state of the labor market" (1976, p. 53). It is assumed that two barometers of responsive supply behavior are student enrolments and the distribution of students across various fields of specialization. In general, the study provided only moderate support for Freeman's conclusion. Some general trends indicate that student choices (as measured by number of applications) are shifting to more traditionally marketable fields such as medicine and law, and away from fields of declining marketability such as Ph.D. programs. There are also increases in the number of qualified applicants to business and commerce schools in Alberta, an area with increased labor market demand. On the other hand, some fields, such as sociology, physics, and chemistry, had fairly consistent enrolments in spite of an estimated surplus of graduates in the labor market. Although teachers were in high demand in Alberta, enrolments dropped substantially. The education potentials may have been responding to media emanating from outside of Alberta where an oversupply of teachers was apparent. There are several additional factors which may possibly mitigate responsive supply behavior. Graduate imports probably altered the stated supply/demand imbalances in most fields and perhaps students are more responsive to the real labor market than this research is able to reveal. In addition, up-to-date information on the labor market is not always available to students nor are all students willing to abandon a chosen field should job opportunities appear scarce. Finally, the 1970 decade was a period of declining political, social, and economic support for universities. Funding cutbacks, tighter admissions policies, additional quota faculties and a more negative climate of opinion than had been prevalent in the free-spending, white collar promotional days of the 1960s quite possibly dampened student response.

The fourth thrust of the present research is the adaptation of a theoretical model for explaining social change processes and the labor market shifts that are manifestations of larger social and economic conditions. The world systems model, introduced by Wallerstein (1974) and effectively applied to the twentieth century by Chirot (1977), is a most appropriate vehicle for predicting and explaining modern events in what has become a global economic network. One of the key events which emphasized this global interdependency was the OPEC oil cartel in 1973. The impact on western industrialized nations was dramatic. Canada, as a net

importer of oil, was faced with a spiralling energy bill because of the inability to immediately reduce either oil purchases or consumption. Since energy increases push up the consumer price index while outflows of money depress the economy, the net result is increasing rates of unemployment coexisting with high inflation. On the other hand, the OPEC cartel produced an economic boom in Alberta, a major producer of oil, and employment opportunities within the province grew. A particularly large demand for highly qualified technological and economic specialists with training relevant to the industrial focus of Alberta was apparent.

Overall, the world systems model is a useful tool for explaining social change. It outlines the presence of regional-national hostility ("regional nationalisms") because of inequalities in power and wealth, it accentuates the fact that world economic events quickly reverberate to the local level and are mirrored by labor market demand, and it points to the presence of both economic and cultural dominance in the world. The abruptness with which labor markets do change is very apparent in the turnaround in Alberta in 1981. The much lower demand and higher unemployment in 1982 are primarily results of two world events: reduced oil and gas consumption in both Canada and the world and a glut of oil on world markets holding prices at a lower than anticipated level.

The economic recession in 1981-82 has finally brought national trends closer to the Alberta scene. Alberta university participation rates had dropped below most of the provinces in Canada during the late 1970s when job opportunities appeared to be mushrooming in the province. Increased enrolments during the 1980s, along with an aging student population, appear to confirm that job availability lures students into the labor force earlier while low demand forces many unemployed back to the university to improve their competitive position.

Implications

A question posed earlier was, "Should the universities be more responsive to labor market demand?" Of course, the answer to this question rests on another, "Can the universities be more responsive to labor market demand?" The research described here suggests that attempts by institutions to match graduate output to labor market demand for particular fields of study would present problems. However, the issue is more complex than these simple questions suggest and is ultimately reduced to whether or not it is more desirable to use a limited manpower projection system or none at all in institutional planning. After presenting some of the practical problems associated with occupational supply and demand projections, a list of how and why the latter may nevertheless be useful to universities will conclude this paper.

Those using projection data should be well informed about the uncertainties and limitations of the data. In the first place, one of the biggest difficulties is the open nature of the system. Universities are provincially governed yet graduates are a very mobile group. For example, while Alberta universities graduated a shortage of highly qualified workers in most fields of study between 1975 and 1979, job vacancies were frequently filled by migration, primarily interprovincial, to the province. It would be very difficult to predict interprovincial migration several years in advance. Thus, although it is currently feasible to obtain a rough estimate of labor market requirements for short and medium term forecasting, it is quite another matter to estimate the numbers from outside the province who will choose to compete for those vacancies. As a case in point, between 1975-76 and 1979-80, a

fairly consistent annual number of between 915 and 1,171 interim certificates were granted to teacher imports to Alberta (Loken, 1980, p. 71). After Alberta Education introduced a portability clause in January, 1982, whereby out-of-province credentials were accepted for certification, there were 3,124 interim certificates granted to teacher imports in the first ten months of 1982 (Alberta Education, November 22, 1982).

A second formidable problem in attempting to match supply to demand for university graduates is the notion of lag. For the highest degrees, long term forecasts ten years hence are required but general experience has proven long-term forecasting to be highly inaccurate. The same problem of time lag invades student responsive supply behavior. The study described here suggests that the diminished marketability for certain levels of specialization, such as the Ph.D. degree, appears to have had the effect of increasing applications to historically marketable fields such as medicine and law. While limitations on enrolments are maintained through quotas, demand in the latter fields is diminishing because of a consistent, moderate provincial output over a number of years combined with a surplus of graduates in some provinces of Canada. A cyclical pattern of shortages and surpluses emerges in some fields of study. Freeman (1971) illustrates that this is particularly noticeable in the field of engineering where the existence of a shortage of personnel and plentiful job opportunities in a particular area of specialization attracts a greater freshman enrolment in the subsequent year which, in turn, causes a surplus after the normal lag period to graduation. The process repeats itself when the graduate surplus discourages freshman enrolment and another shortage ensues after the appropriate four year lag. For the Ph.D. degree, lag time is so extensive that long term shortages have, in the past, been filled by foreign recruitment. In summary, it is difficult for institutions to produce accurate long-range forecasts (which rely on economic forecasts) for determining Ph.D. demand, for example, ten years in advance. In addition, student response always lags behind demand for the length of the particular training required.

Another problem area in balancing university supply to labor market demand is the possibility of an abrupt change in the economy. Market demand for all graduates may shift radically during the training period. The selection of the world systems model of social change is an attempt to illustrate national vulnerability and global interdependency in the late twentieth century. On the national as well as the Alberta front, economic waves of prosperity and recession are neither predictable nor controlled by provinces or nations. Moreover, the model suggests that the capitalist world is now entering a contraction period and that rapid economic expansion is the thing of the past. This latter problem alone will have a profound impact on the job prospects of university graduates, already a steadily increasing segment of the population.

It is apparent that there are practical problems in having universities respond to manpower projections. Nevertheless, good projections could be useful to universities as one of many administrative tools. Manpower planning is frequently criticized on the philosophical basis that it is neither the role nor the responsibility of the university to deflect people from preferred career paths. Current practices, such as the use of enrolment quotas in an increasing number of faculties, mean that universities are already engaged in a deflecting and sorting process which may or may not be largely labor market oriented. The rationale for the latter kind of decision making is rarely made public.

For several reasons universities could benefit from manpower projections, albeit imperfect ones. First, outside pressure to use occupational supply/demand imbalances is increasing and the data are acceptable to a public who have otherwise been uninformed about the logic behind higher educational alterations. Second, students frequently request information about employment opportunities on which to base career decisions. Third, universities can use the information for program modification and increased flexibility in an era of rapid change.

By incorporating manpower projections into other planning approaches, universities need not abandon that very important traditional role: to graduate students with the ability to solve problems, analyze, communicate effectively, and who are independent learners capable of adapting to new situations, jobs, and challenges as they come along.

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Second Language Teaching Styles: Making or Breaking Attitudes

The possibility that direct and/or indirect relationships between attitudes and second language learning may be differentially affected by specific second language teaching styles was examined. Second language teaching styles refer to the sustained configuration of percentage frequencies on categories of discourse functions which are considered to be accurately descriptive of classroom oral events. The Language Teaching Record Scheme (LTRS) was used to code classroom interaction for a total of 3 random visits for each of 14 teachers taken from the Intensive Programme. The cluster analysis technique yielded four distinct styles of which three were found to be relevant to attitudes. Analyses of covariance indicated that the hypothesized interaction of teaching style with attitudes towards language learning was supported. Significant interaction effects ($p < .10$ or better) between specific teaching styles and specific categories of students measured on Attitudes towards French Canadians, Attitudes towards Learning French, and Desire to Learn French were found on adjusted group means for aural comprehension scores. Pretreatment scores on aural comprehension were used as the covariate. Significant main effects ($p < .05$) were also found for distinct teaching styles in the same programme.

The direct association between attitudes and second language achievement is now firmly established (Burstall, 1975; Chastain, 1976; Gardner & Lambert, 1972; Mueller & Miller, 1970; Tucker, Hamayan & Genesee, 1975). On a more basic level, attitudes are also seen as a complex support system for motivation in second language learning (Gardner, Gliksmann & Smythe, 1978). From these findings, it may be concluded that the relationship between attitudes and achievement in second language learning is both direct and indirect. Recently, a question of a very different but not unrelated order has begun to receive attention. Research on second language teaching styles (Gayle, 1982b) has attempted to explore the

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importance of this classroom variable to learning. This research was inspired in part by conjectures and hypotheses relevant to the broader educational setting on the possibility of student/treatment interactions (Cronbach, 1957; Lewin, 1935) and, more specifically, by interactions discussed in the general literature between student characteristics and teaching style (Canfield, 1978; Flanders, 1970; Hunt, 1971; Myers, 1980; Pervin, 1968). Gayle found that second language teaching styles do make a difference to the relationship between specific student aptitudes and student learning. This led to the interesting speculation that, even if considered incapable of eradicating negative attitudes entirely, specific second language teaching styles may be sufficiently potent to break the behavioural (withdrawal) component (Katz & Stotland, 1959) which accompanies the affective ingredient of a negative attitude.

Second language teaching styles have been defined (Gayle, 1982a, 1982b) as the sustained configuration of techniques or teacher characteristics identified on specific dimensions of second language teaching—that is, configurations which pertain to discrete behavioural or characterological categories combined to form well defined teaching *patterns*. Previous to this, teaching techniques had been discussed extensively with reference to possible outcomes in both general content classrooms and the second language classroom (Fanselow, 1977; Mackey, 1965; Orme, 1978). However, the one to one study of specific techniques and learning outcomes or of global, unanalyzed strategies and learning outcomes can hardly lead to a complete understanding of what brings learning about. Gayle (1980a, 1982b) suggests that a dynamic and complex process such as second language learning can only be understood if the conditions of learning provided by the teacher are perceived as a systematic gestalt of contributing but clearly identifiable parts. With this conviction it appears that there is further need for the study of the effects of second language teaching style when the dimension(s) of concern have been analyzed in terms of a set of exhaustive but discrete categories.

The concept of teaching style should also offer a better explanation of the nature of second language classroom interaction than the traditional reference to method since styles are specified in retrospect after intensive observation of behaviours which actually occurred. That is, teaching styles are not prescriptive but descriptive. Specifically, teaching style would avoid the type of confusion attributed by Mackey to past use of the term, method, where it was not the presentation done by the teacher that was being analyzed, but rather that done by the method through its texts, films, and recordings (Mackey, 1967). Teaching style brings the researcher into direct contact with the teacher and with classroom events.

In describing teaching styles or the composite of classroom events enacted or allowed by the teacher, care must be taken to collect data by the use of observation schemes which are based on discrete non-redundant categories. That is, a valid conclusion cannot be reached regarding the relationship of teaching style to learning outcome if inter-coder reliability and/or the validity of the instrument has been prevented by the presence of ambiguous or overlapping categories.

Previous exploratory research (Gayle, 1982b) implementing the Language Teaching Record Scheme (LTRS) (Gayle, 1980a) identified a number of second language teaching styles based on percentage frequencies for discourse functions. The LTRS is a second language classroom observation instrument which attempts to analyze teaching on a number of dimensions using categories within each dimension which are exhaustive but discrete. On this basis it facilitates the study of

student outcomes which may be interpreted as the result of combinations of teacher behaviours. Discourse functions refer to only one dimension of teaching analyzed by the LTRS and describe the *pedagogical* function of the oral behaviour rather than its linguistic function. A statistical cluster analysis of teachers was derived from data for individual teachers using percentage frequencies for all discourse functions simultaneously. These data were pertinent to both teacher talk and student talk. Four distinct clusters associated with four distinct styles emerged. Three of these styles, identified here as H, J, and L, are displayed in Table 1. Figures shown in Table 1 represent total percentage frequencies for all teachers in their respective clusters. Asterisks in Table 1 highlight those categories which receive comparatively greater emphasis than their counterparts in the contrasting style. Table 2 gives a relatively detailed definition of each category.¹

The concept of teaching style adheres to the notion that a particular teaching style is a relatively stable phenomenon within a cluster of teachers and tends to exhibit some features which may be referred to as dominant since they quantitatively overshadow the rest. The findings recorded in Table 1 illustrate that this dominance is often complemented by another type of preponderance which is the direct outcome of comparisons between styles as the quantitative strength of the categories in one style is compared with that of their counterparts in another style on the horizontal plane.

Categories in Table 1 have been arranged in order to juxtapose those discourse functions which appear, on the basis of previous research (Gayle, 1982b), to be associated logically and/or empirically. These groups have been regarded as strategies which can be used to facilitate discussion and comparison of styles as well as to suggest explanation of their effects. Six strategies have been identified: *Basic or Stock Strategy*, *Language Exposure*, *Independent Analysis and Use of Language (Enterprise)*, *Mechanical Use of Language*, *Direction*, and the *Verbal Processing* strategy.

The *Basic or Stock* strategy is comprised of the single discourse function, specific information, which is regarded as the “filler” category for any style since it serves as the backbone for all classroom interaction in the Intensive Programme.² Its frequency tends to be obviously reduced when other discourse functions are more heavily used.

The term *Language Exposure* is intended to convey the idea that, with use of these categories, students are allowed more extensive experience with the language beyond the minimal question/answer paradigm. This strategy covers the categories general information, reading, writing, illustration and rephrasal.

The strategy *Independent Analysis and Use of Language* describes the teacher’s or student’s intense readiness to use the language to the point of being willing to initiate a *change* (digression) in the subject matter in order to prolong the discussion. Occurrence or encouragement of this extreme type of language readiness is measured by the single category, initiation. The strategy *Independent Analysis and Use of Language* also includes the use of the discourse function, implicit correction, which calls on the student to analyze language independently and extrapolate the essence of the rule. In summary, the student must be confident enough to use language creatively and extensively and to make linguistic inferences as a budding entrepreneur would.

TABLE 1
TEACHING STYLES IDENTIFIED FROM A CLUSTER ANALYSIS^a
OF TEACHERS AND BASED ON TOTAL PERCENTAGE FREQUENCIES
FOR DISCRETE DISCOURSE FUNCTIONS

Strategy	Discourse Functions	H Lateral	J Balanced	H Lateral	L Linear	J Balanced	L Linear
BASIC	Specific Information	151.30*	135.73	151.30	157.75*	135.73	157.75*
LANGUAGE EXPOSURE	General Information	6.73	8.37*	6.73	10.41*	8.37	10.41*
	Reading	57.21*	40.32	57.21*	14.60	40.32*	14.60
	Writing	0.00	13.64*	0.00	0.00	13.64*	0.00
	Illustration	0.33	0.57*	0.33	1.37*	0.57	1.37*
	Rephrasal	<u>7.21*</u>	<u>2.20</u>	<u>7.21</u>	<u>7.22*</u>	<u>2.20</u>	<u>7.22*</u>
		71.48	65.10	71.48	33.60	65.10	33.60
INDEPENDENT ANALYSIS & USE OF LANGUAGE (ENTERPRISE)	Initiation	0.41*	0.37	0.41*	0.00	0.37*	0.00
	Implicit Correction	<u>6.23*</u>	<u>2.23</u>	<u>6.23*</u>	<u>5.03</u>	<u>2.23</u>	<u>5.03*</u>
		6.64	2.60	6.64	5.03	2.60	5.03
MECHANICAL USE OF LANGUAGE	Complete Repetition	8.73	23.31*	8.73	43.54*	23.31	43.54*
	Partial Repetition	2.79*	2.65	2.79	5.85*	2.65	5.85*
	Expansion to Full Sentence	<u>2.05</u>	<u>4.15*</u>	<u>2.05</u>	<u>9.16*</u>	<u>4.15</u>	<u>9.16*</u>
		13.57	30.11	13.57	58.55	30.11	58.55
DIRECTION	Acceptance	25.12*	20.38	25.12*	15.64	20.38*	15.64
	Rejection	2.29	4.38*	2.29*	1.73	4.38*	1.73
	Directive	<u>11.98*</u>	<u>8.75</u>	<u>11.98*</u>	<u>3.80</u>	<u>8.75*</u>	<u>3.80</u>
		39.39	33.51	39.39	21.17	33.51	21.17
VERBAL PROCESSING	Explicit Correction	9.91*	8.41	9.91*	7.40	8.41*	7.40
	Indication of Possible Error	1.52	3.46*	1.52	2.20*	3.46*	2.20
	Clarification	1.96	7.62*	1.96*	0.14	7.62*	0.14
	Grammar Clue	0.00	1.89*	0.00	0.59*	1.89*	0.59
	Spec. Info. (clue)	2.73	7.51*	2.73	11.65*	7.51	11.65*
	Gen. Info. (clue)	0.16	0.69*	0.16	0.17*	0.69*	0.17
	Illustration (clue)	0.00	0.49*	0.00	0.00	0.49*	0.00
	Rephrasal (clue)	0.27	2.29*	0.27	1.03*	2.29*	1.03
	Cross-lingual Clue	0.41*	0.31	0.41*	0.00	0.31*	0.00
	Translation	<u>0.41</u>	<u>0.57*</u>	<u>0.41</u>	<u>0.50*</u>	<u>0.57*</u>	<u>0.50</u>
		17.37	33.24	17.37	23.68	33.24	23.68

Note. Asterisks highlight those categories in a style which have higher frequencies than their counterparts in the comparison style.

^aEach group chosen from the cluster analysis for study was comprised of three teachers.

TABLE 2
DESCRIPTION OF DISCOURSE FUNCTIONS

Discourse Functions	Description
Specific Information	The use of close-ended questions which elicit the single correct answer. Responses which conform to this type of question and therefore tend to be stereotypical.
General Information	The use of open-ended questions. Creative use of language including the presentation of comments, opinions, arguments, personal experiences or fictional statements which have not been rehearsed in the classroom.
Reading	The act of reading either aloud or silently a word, sentence or series of sentences in order to practise the skill or to focus attention on the subject matter of subsequent interaction.
Writing	The request for or execution of writing during oral interaction.
Illustration	Any example of a previous rule or generalization (regarding content or structure).
Rephrasal	Expression of a statement or question in different words without the basic meaning being changed and without adding information. This category includes a summary of a previous passage or statement.
Initiation	Extreme readiness to utilize language freely and extensively as seen when the speaker continues to speak, <u>after</u> his response has been given, by voluntarily <u>changing the subject matter</u> .
Implicit Correction	Substitution of the error with the correct form without drawing attention to the nature or location of the error.
Complete Repetition	Use or elicitation of <u>verbatim</u> repetition.
Partial Repetition	Use of elicitation of repetition of only the <u>essential</u> part of a preceding response for reinforcement or confirmation.
Expansion to Full Sentence	Teacher insistence on the use of the grammatically complete sentence. Emphasis on form rather than essential content.
Acceptance	Positive evaluation (agreement with) the content or form of a previous response.
Rejection	Negative evaluation (disagreement with) the content or form of a previous response.
Directive	A command or request for a response which is nonverbal (an action or activity).
Explicit Correction	Indicating exactly <u>what</u> was wrong.
Indication of Possible Error	Correction which is purely suggestive and offers no specific help to the student; for example, "Est-ce qu'on dit ça?"
Clarification	The <u>reason</u> for the correctness/incorrectness of the linguistic form or content of the previous response. The clarification is not a clue (i.e., it is given <u>after</u> the response).
Grammar Clue	Reference to or citation of the grammatical features of the language being learned in order to help the student arrive at the correct answer.
Specific Information (clue)	Communication of specific information required by the student to arrive at <u>the</u> correct answer.
General Information (clue)	Communication of general information which may be used by the student to arrive at any acceptable answer.
Illustration (clue)	Illustrations which enable the student, by induction or analogy, to find an answer.
Rephrasal (clue)	Utilization of a rephrasal due to lack of comprehension or hesitation on the part of the person who is attempting to respond.
Cross-lingual Clue	Reference to the linguistic features of a language <u>other than</u> the one being learned to help the student find the correct answer.
Translation	Elicitation or use of translation to develop the skill or to increase facility in the second language. The <u>ad hoc</u> translation from a language into any other to support further interaction or to increase comprehension.

Note. Fuller explanation of the use of these categories during coding may be found in Gayle (1980a, 1980b).

Mechanical Use of Language is characterized by a concern for accuracy, automaticity, and precision; this refers to the type of precision which induces habit formation and which is not necessarily based on a thorough understanding of linguistic structure. It covers the categories complete repetition, partial repetition, and expansion to a full sentence. Experience in second language classrooms has prompted the belief that the combined effect of these categories in the absence of high student aptitudes (such as high ability for language analysis [Pimsleur, 1966]) may merely be to guarantee automatic responses which cannot necessarily promote

transfer of learning to different situations. Research (Gayle, 1982b) has supported the view that students high on the aptitude Language Analysis are better facilitated in aural comprehension by teaching styles which include emphasis on this strategy than are their counterparts low in language analysis.

The fifth strategy, *Direction*, alludes to all teacher behaviours which attempt to manage students by keeping them in touch with the teacher's personal wishes, likes, and dislikes. These behaviours are additional to the information passed on in, for example, corrections. The strategy refers to the categories acceptance, rejection, and directive.

The *Verbal Processing* strategy³ refers to all categories which demand or give explicit explanations or analyses—that is, categories which help the individual to monitor what he is saying. It covers the categories explicit correction, indication of possible error, clarification, grammar clue, specific information (clue), general information (clue), illustration (clue), rephrasal (clue), cross-lingual clue, and translation. Use of these categories may refer not only to the formal linguistic properties of the previous sentence but also to its meaning.

The merit of discussion based on these strategies rather than on other strategies previously discussed in the literature (e.g., the formal/functional, implicit/explicit, etc. [Stern, 1974]) is that (a) the present strategies are not merely ideational, (b) the discourse functions which contribute to these strategies emerged during empirical classroom observation and were tested throughout the validation of the LTRS for precision to avoid overlap, and (c) with the avoidance of overlap, which would distort the clarity of the configuration and hinder comparisons, the style which emerges is coincident with the total of the discourse functions in their allotted proportion (grouped under strategies) to assume a distinguishable character and a pattern all its own. Style is therefore an instrument which can be measured to explain results in its application to different types of students by different teachers.

The vertical proportions displayed in Table 1 for the teaching styles H, J, and L indicate the relatively stable features of each style and their respective dominance(s). In all styles the *Basic* strategy, characterized by closed-ended questions and answers, has by far the most outstanding percentage frequency. Examination of subtotals in the columns "H" shows that style H is most dominant in the *Basic* strategy and the strategy *Language Exposure* and least outstanding in the strategy *Independent Analysis and Use of Language*. The three remaining intermediate strategies, *Mechanical Use of Language*, *Direction*, and *Verbal Processing*, have disparate strengths among them, *Mechanical Use* having the smallest frequency and *Direction* the largest. Apart from the high frequency for the *Basic* strategy, prominent in *all* styles, the strongest contributions in style H are from the strategies *Language Exposure* and *Direction*. *Language Exposure* has been defined as extensive experience with the language and observation in second language classrooms suggests that teacher talk is often most spontaneous in the context of the strategy *Direction*. In addition, the strategy *Independent Analysis and Use of Language*, although the weakest numerically in this style, carries a frequency higher than it does in any other style. For these reasons, style H appears to weigh heavily on a certain lack of inhibition or restriction in the use of language and has been assigned the label *OPEN (LATERAL) Language*.

In contrast to style H, once the *Basic* strategy has been accounted for, style L shows greatest dominance in the strategy *Mechanical Use of Language*, least

emphasis still being placed on the strategy *Independent Analysis and Use of Language*. The frequency for *Mechanical Use of Language* in style L is significantly higher than it is for any other style. Moreover, although a frequency of 5.03 is preserved for the strategy *Independent Analysis and Use of Language* in this style, none of this is located in the discourse function, initiation. These facts, together with obvious modulations in frequencies for *Language Exposure* and *Direction* in comparison with style H (Lateral Language) suggest that style L shows relatively stronger tendencies towards restricted use of language and is therefore described as *LINEAR Language*. It should be noted that although this concept seems to rest heavily on the single strategy *Mechanical Use of Language*, this strategy has a frequency almost twice as high as any other strategy in the style.

In style J, the most outstanding strategy (excluding the *Basic* strategy) is *Language Exposure*, the least outstanding is *Independent Analysis and Use of Language*. However, in contrast to style H, the precise numerical proportions show less emphasis on *Language Exposure*, *Direction*, and *Independent Analysis and Use of Language* and more emphasis on *Mechanical Use* and *Verbal Processing*. Since style J retains the use of the discourse function, initiation, which is perhaps the most lateral of all categories and shows frequencies in style J second only to style H, and because style J shows fairly equal proportions on the strategies *Direction*, *Verbal Processing*, and *Mechanical Use* (that is, a mixture of strategies contributing to both lateral and linear language use), style J has been designated *BALANCED*.

The fourth style, K (INFORMATION), which emerged from the cluster analysis, has more relevance to aptitudes (Gayle, 1982b) and, for convenience, has been omitted from Table 1.

A true comparison of styles cannot be made without looking more closely at what the figures in the respective categories disclose on the horizontal plane. When styles H (Lateral Language) and J (Balanced) are compared in terms of horizontal proportions, it is found that style H is preponderant on the strategies *Basic*, *Language Exposure*, *Independent Analysis and Use of Language*, and *Direction*. Predominances in favour of style J on the strategies *Mechanical Use of Language* and *Verbal Processing* are in excess of ten units.

In the H-L comparison (see Table 1) it is found that predominant strategies in style H (Lateral Language) are *Language Exposure*, *Independent Analysis and Use of Language*, and *Direction*. The numerical strength of *Language Exposure* in style H is more than twice that of the same strategy in style L (Linear Language) (a difference of almost 40 units). Most of this dominance must be attributed to the category, reading. Strategies which are horizontally preponderant in style L (Linear Language) are *Basic*, *Mechanical Use of Language*, and *Verbal Processing*. The differential in favour of style L is largest for the strategy, *Mechanical Use of Language* (a difference of just over 40 units). The dominance for the most outstanding horizontal contrasts between styles H and L, is, therefore, almost equally weighted in the two styles.

In the J-L comparison predominant strategies in style J (Balanced) are *Language Exposure*, *Direction*, and *Verbal Processing*. The numerical strength of *Language Exposure* in style J is almost twice that of this strategy in style L and most of this dominance may be claimed by the category, reading. The preponderance in *Language Exposure* is much greater than that in the other two strategies. Preponderance in style L (Linear Language) is seen in the three

strategies *Basic, Independent Analysis and Use of Language*, and *Mechanical Use of Language*.

In no instance do the figures for the strategy *Independent Analysis and Use of Language* exceed 6.64. This was expected since the basic methodology in the Intensive Programme shows strong tendencies towards the audiolingual approach based on the stimulus-response association model. However, as a result of its general rarity and low predictability within the Programme, this strategy could be expected to make a difference wherever it occurs.

Elements related to the discourse functions in styles H, J, and L have been discussed in numerous works which considered the effects of specific teaching techniques or behaviours on learning outcome. For example, the following have been respected—the need for meaningful material (Carroll, 1966), reference to and practice of rules for syntactic structures (Chomsky, 1957; Jakobovits, 1970; Lakoff, 1969; Rivers, 1968), the use of the paraphrase, inference questions, contrasts such as translation, feedback (Fanselow, 1977), writing (Paulston, 1976), and repetition and frequent exposure of basic sounds (Rivers, 1981). In most cases individuals have posited a rationale for the effect of these techniques. Rivers, for example, suggests that foreign language sounds are like a stream of undifferentiated noise. Students are so busy listening for familiar sounds that they may not concentrate on meaning and retention. Repetition and frequent exposure to basic sounds and structures are therefore important elements in teaching for listening comprehension. However, in spite of these and similar postulations regarding the benefits of singular techniques, it remained extremely difficult to make definite predictions regarding the effect of each treatment (teaching style) in this study owing to their complex and diverse character. In order to be consistent with the implications of the concept of teaching style, the differential effects of treatments H, J, and L would depend on the distinct *pattern* of strategies and emphases which was peculiar to each. Since theory on second language teaching style has yet to be articulated, expectations in the form of specific predictions were not entertained.

The problem of relating teaching styles to attitudes towards second language learning was even more tangled. It could be argued that some teaching styles, depending on their emphases in the use of discourse functions and strategies, may confront the low attitude student with more experience outside the orbit of material unique to the French culture. That is, these students may learn to listen for reasons other than French. Speculations are always interesting but often lead astray. They seem even more futile when complex teaching styles are involved. The study was therefore given an exploratory orientation and approached with a minimum of general expectations. The most explicit of these was that since teaching styles demonstrate different configurations of discourse functions used, they would contribute to significant interaction effects with specific attitudes on the criterion variable.

In order to exploit a quasi-experimental design, care was taken to separate the true effects of attitudes and teaching styles on aural comprehension from other potential sources of difference. Reference to the literature on second language learning showed that variables which needed to be measured and controlled because of prior claims of their relevance to language acquisition were motivational intensity (Gardner & Lambert, 1972), second language aptitudes (Carroll, 1966; Pimsleur, 1966) and a general measure of intelligence.

Method

Sample

The original sample of 14 teachers at the grade 6 level in different boards in Ontario volunteered to assist in the study. All teachers participated in the Intensive Programme and offered 75-minute lessons each day per week. Students were instructed in both Social Studies and French Language Arts. Teachers were grouped on the basis of a cluster analysis procedure. Only groups comprised of the same number of teachers (groups H, J, K, and L) were retained for further analysis. Group K is omitted from the present discussion for reasons previously explained. The 118 students who were taught by the nine teachers in groups H, J, and L and who were present for all phases of the testing were used in the analyses described in the following discussion.

Instruments

The Language Teaching Record Scheme (LTRS) (Gayle, 1980a) was used to collect data for the identification of second language teaching styles. The LTRS is a research instrument constructed specifically for the purpose of identifying teaching styles in second language classrooms. Research procedures facilitated by the LTRS differ from those adopted in previous observation of the second language classroom (e.g., Fanselow, 1977; McEwen, 1976) since the LTRS (a) attempts analysis of teaching using categories which are exhaustive yet discrete and (b) simultaneously promotes the study of the effects of combinatory associations among these categories thus utilizing the composite concept referred to as Style.

Both the LTRS and the model on which it was based (Gayle, 1978) were constructed from extensive empirical evidence and classroom data in a number of programmes (inclusive of the Intensive Programme) and boards. The categories of the LTRS are therefore considered to be exhaustive for the type of programmes in which it was validated. The category system it employs refers to a number of dimensions of teaching. The particular dimension of the LTRS (and thus of teaching style) explored in this study is the discourse function which has been defined as the communicative use or role of the message. The discourse function refers only to the *pedagogical* function of the oral behaviour and not to its linguistic function. It therefore specifies teaching techniques used to enhance learning during oral communication and includes student verbal behaviours allowed or encouraged by the teacher. The 24 categories of discourse function used in this study (see Table 2) are not intended to describe the content of the oral communication nor the type of visual aids used, aspects which are described in other dimensions.

Coefficients of observer agreement for the dimension of the LTRS known as the discourse function were .96 (based on Scott's 1955 formula) and .88 (based on Cohen's 1960 formula). This is significant not only in relation to the reliability of the LTRS but also to its validity. The definition of validity offered by Medley and Mitzel (1963) holds that an observation system must provide an accurate record of behaviours which actually occurred in such a way that scores are reliable. The power of the LTRS to record classroom events faithfully is also reflected in the finding (Gayle, 1980b) that among a total of 956 discourse functions selected randomly from two classes only eight ambiguities were discovered; that is, on only

eight occasions did coders see applicability of more than one category on this dimension to the same verbal behaviour in question. Other measures of the instrument's validity include data (Gayle, 1980b) for coefficients of variation across the total validation sample with respect to each category. These data reflect known emphases in the Intensive Programme and the other programmes covered in the validation sample. Perhaps the factor which outweighs all others as an index of the validity of the LTRS is the source of the categories used in the instrument. Categories were not selected arbitrarily from theory nor from those of other observation instruments nor were they conceptualized in abstract. Rather, they emerged as a result of direct observation of classroom events in an extensive validation sample (using over 50 second language classrooms), thus ensuring the relevance of the categories to what actually takes place during teaching. This procedure was followed by inter-observer analysis and evaluation of categories in terms of the existing literature. The content validity of the LTRS is discussed by Gayle (1980b).

A complete description of the empirical procedures used in developing the instrument and a detailed evaluation of its psychometric properties are found in the appendix to the document (Gayle, 1980a) and in the report of a longitudinal study (Gayle, 1980b). Application of the statistical cluster analysis technique to percentage frequencies for all 24 categories of discourse functions allows the identification of groups of teachers who are more homogeneous in their use of discourse functions and thus allows the identification of teaching styles.

Gardner's attitudinal/motivational battery (Gardner & Lambert, 1972) was used to determine student Attitudes towards French Canadians, Attitudes towards Learning French, Desire to Learn French, and Motivational Intensity. The Pimsleur Language Aptitude Battery (Pimsleur, 1966) was used to determine aptitudes for Vocabulary, Language Analysis, Sound Discrimination, and Sound Symbol Association. Subscores on the attitude and aptitude batteries used were treated as individual scores. Scores for general intelligence were derived from the Dominion Group Test of Learning Capacity and measures of the criterion variable, auditory comprehension, were taken from the Quebec Ministry of Education Test of French as a second language. This test was originally constructed for students in the final (sixth) year of elementary school.

Procedure

Teachers in styles H, J, and L (see Table 1) had been identified during the first term of the school year subsequent to three consecutive random visits by trained coders to each of 14 volunteer teachers in the total sample. Coders first transcribed alternate five-minute periods of taped classroom interaction for each class in the total sample. The LTRS was later applied to determine percentage frequencies for categories of discourse functions. Cluster analyses of teachers based on these frequencies identified 4 distinct teaching styles including styles H, J, and L.

Testing of students was not carried out at the beginning of the school year since it was necessary for all teachers to be recruited before simultaneous measurement of students could begin. At the beginning of the Winter Term each class was visited once for the administration of the aural comprehension test (pretest) and Gardner's attitudinal/motivational battery. Tests conducted during three visits to each class in June of the same year were aural comprehension (posttest) and measures of language aptitude and intelligence. Aptitudes and intelligence were not considered

to be sufficiently labile to be significantly affected by prior treatments during the study (Keppel, 1973).

Analyses

As indicated previously, teaching styles H, J, and L were identified through the statistical cluster analysis technique. Data for students were subsequently grouped on the basis of their teacher’s teaching style.

Due to the *exploratory* nature of this study and the importance of identifying relationships which may exist among the populations, the decision was made not to apply conventional levels of significance rigidly but to allow a degree of latitude with the intention of increasing the probability of Type I as against Type II errors in the final outcome.

Two-way analyses of covariance were carried out to test for interaction effects between teaching style and attitudes on aural comprehension. The three pairs of teaching styles referred to previously (HJ, HL and JL) were used in turn as the first independent factor. In each case, levels of each of the four attitude/motivation variables identified as Attitudes towards French Canadians, Attitudes towards Learning French, Desire to Learn French, and Motivational Intensity were used in turn as the second independent factor. Cutpoints for these affective variables were identical with the midpoint of the range for each subsample. For each analysis of covariance only those variables which were not being used as an independent factor and which had a linear relationship with the criterion $\geq .60$ (see Table 3) were actually used as covariates. Adjustments were made for unequal cell sizes in the analyses of covariance.

TABLE 3
REGRESSION COEFFICIENTS FOR AUDITORY COMPREHENSION
(POSTTEST) FOR EACH OF THREE SUBSAMPLES
(PAIRS OF TREATMENT GROUPS)

Variable	HJ	HL	JL
Auditory Comprehension (pretest)	0.84*	0.75*	0.72*
Intelligence	0.03	0.27*	0.32*
<u>Aptitudes</u>			
Vocabulary	0.22	0.09	0.29*
Language Analysis	0.07	0.08	0.10
Sound Discrimination	0.01	0.03	0.26*
Sound Symbol Association	0.16	0.29*	0.30*
<u>Attitude/Motivation</u>			
Attitudes towards French Canadians	0.03	0.08	0.11
Attitudes towards Learning French	0.15	0.28*	0.30*
Desire to Learn French	0.22*	0.31*	0.23*
Motivational Intensity	0.22*	0.24*	0.20

* $p < .05$

Results and Discussion

As explained previously, absence of theory on second language teaching styles demands present attention to exploratory research rather than the testing of specific hypotheses. One general expectation, however, was that teaching styles such as styles H and L which offered different emphases in the discourse functions used, resulting in distinct behavioural configurations, would interact significantly with attitudes on aural comprehension, the criterion variable.

Only one variable (auditory comprehension pretest) qualified to be used as a covariate with the criterion ($r \geq .60$) (see Table 3).

Extremely large numerical differences between means of the various subgroups were not anticipated since the treatment covered a period of only six months. Differences found were promising and suggest the need for continuing research.

Three of twelve analyses of covariance produced the expected interactions at the .10 level of significance or better (see Table 4). All three interactions were located in designs involving the comparison teaching styles H and L. That is, teaching styles H and L interacted significantly with each of Attitudes towards French Canadians, Attitudes towards Learning French, and Desire to Learn French on aural comprehension. When instructed with teaching style H (Lateral Language), students with relatively low Attitudes towards French Canadians and low Desire to Learn French scored higher on aural comprehension than students with high attitudes. The interactions for these designs were disordinal (see Figure 1 and Table 5). Unlike these two designs, the design involving Attitudes towards Learning French did not show a disordinal interaction; rather, when taught by style H students with relatively low Attitudes towards Learning French did not score quite as high as the high attitude students although they scored appreciably higher than the low attitude students did when taught by style L (Linear Language) (see Figure 1 and Table 5).

Three significant ($p < .05$) main effects were also found. Students with high Attitudes towards Learning French scored consistently higher than low attitude students on aural comprehension in the HL and JL designs. When the factor Desire to Learn French was examined in the JL subgroup, a significant main effect was found for teaching style with style J (Balanced) students scoring higher than style L (Linear Language) students, irrespective of the intensity of their desire to learn the language (see Tables 4 and 5).

Explanation of the tendency for low attitude students to score higher on aural comprehension when taught by teachers in style H (Lateral Language) than when taught by teachers in style L (Linear Language) and, at times, to score even higher than the high attitude students taught by style H, may be offered by the speculation that these students experience style H as an attractive treatment. The possibility exists that the low attitude student's interest is awakened or bolstered by the teacher's relatively greater personal attention to students in style H as may be illustrated in the emphasis placed on a number of strategies. Perhaps students enjoy being called on to read (the strategy *Language Exposure*), to be "on stage." Perhaps they welcome frequent directions and appraisals given by the teacher (the strategy *Direction*). Perhaps they are motivated by the opportunity to take the initiative during the interaction (the strategy *Independent Analysis and Use of Language*). The intense personalized treatment afforded by style H may therefore stimulate students' interest in the spoken word, since they have been inspired to put in their penny's worth as some would say, or to bid for "air time." This would

culminate in higher scores on aural comprehension for low attitude students in spite of their negative attitude. In contrast, style L (Linear Language) would probably engulf students in impersonal choral repetition and drill work. Listening to what is being said would have little pay-off for low attitude students in this latter case.

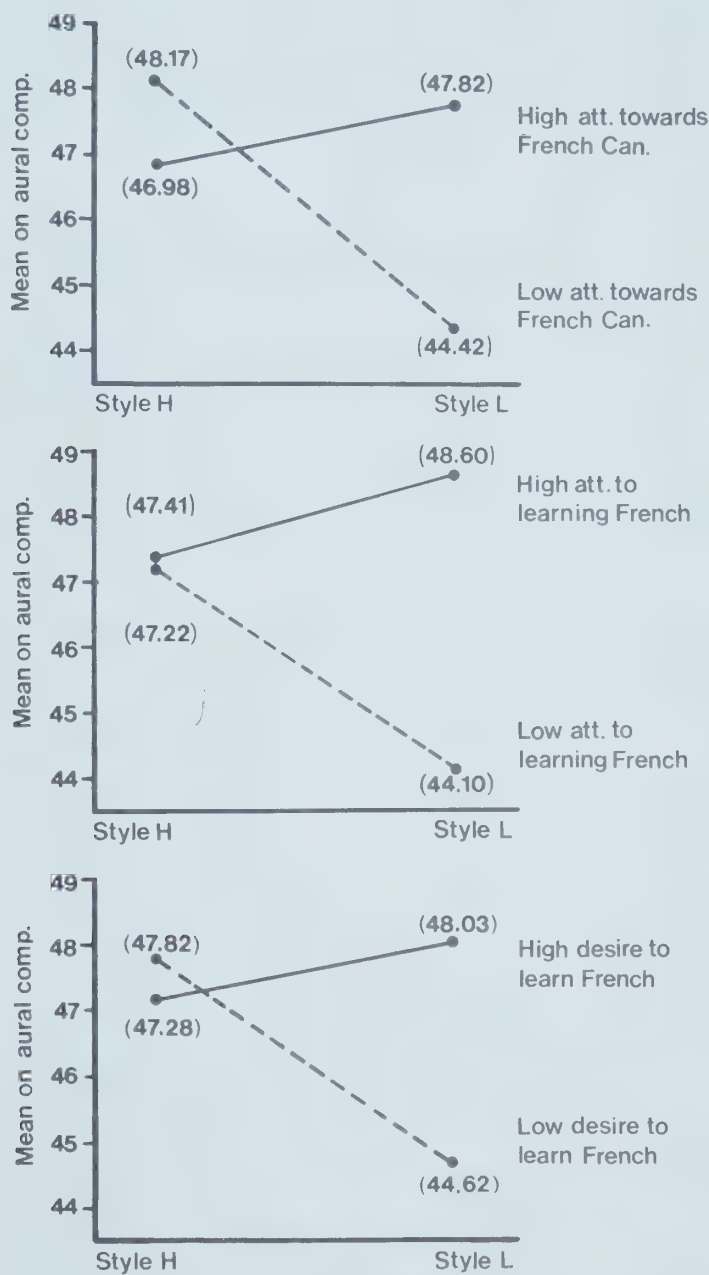


Figure 1. Interactions between teaching style and attitudes on aural comprehension.

A number of possible alternative explanations exist for the higher scores on aural comprehension acquired by low attitude students exposed to style H. The following conjectures may be made:

(a) teaching style affected the second independent variable (attitude) during the actual treatment period. The potential effect of treatment on the second independent variable is discussed in the literature on the aptitude/treatment

interaction (ATI) model (Hunt, 1971; Cronbach & Snow, 1977) and the actual effect of treatment on attitudes is reported in the general research on classroom interaction analysis (Amidon & Flanders 1963; La Shier, 1965; Moskowitz, 1970). Since attitudes are known to have a positive relationship with achievement in the second language (e.g., Burstall, 1975), the effect of teaching style on attitude in this study would have had to occur in the form of a reversal of attitudes (e.g., the low became high and the high became low) in order to have generated the performance scores seen in Figure 1. If this alternative conjecture is accepted, the differential effect of teaching style H is even more apparent than in the first interpretation of the results since style H would be capable of changing attitudes radically.

TABLE 4
TWO-WAY ANALYSES OF COVARIANCE
ON AUDITORY COMPREHENSION SCORES

Source	<i>df</i>	<i>MS</i>	<i>F</i>
Teaching Styles H, L	1	32.64	1.78
Attitudes towards French Canadians	1	21.65	1.18
TA	1	92.03	5.02 **
Covariate (auditory comp. pretest)	1	1773.19	96.71
Error	75	18.34	
Teaching Styles H, L	1	15.66	0.90
Attitudes towards Learning French	1	93.19	5.37 **
TA	1	86.47	4.98 **
Covariate (auditory comp. pretest)	1	1306.69	75.24
Error	75	17.37	
Teaching Styles H, L	1	24.35	1.33
Desire to Learn French	1	38.66	2.11
TA	1	70.28	3.84 *
Covariate (auditory comp. pretest)	1	1818.69	99.32
Error	75	18.31	
Teaching Styles J, L	1	58.21	3.30
Attitudes towards Learning French	1	137.01	7.76 **
TA	1	56.99	3.23
Covariate (auditory comp. pretest)	1	1180.24	66.88
Error	76	17.65	
Teaching Styles J, L	1	90.54	4.80 **
Desire to Learn French	1	51.06	2.71
TA	1	56.47	3.00
Covariate (auditory comp. pretest)	1	1774.23	94.11
Error	76	18.85	

* Significant at .10 level
** Significant at .05 level or better

(b) the presence of French Canadian teachers in the H group facilitated positive changes in Attitudes towards French Canadians and Desire to Learn French. If this view is being taken, it is pointed out that style L was also comprised exclusively of French Canadian teachers but their presence did not result in the same student performance. It can therefore be safely assumed that performance in style H was not brought about by teachers per se but by the style.

TABLE 5
DESCRIPTIVE STATISTICS FOR SUBGROUPS
IN ANALYSES OF COVARIANCE

Teaching Styles	Subgroups	N	Adjusted Means	SD
H,L	H, Low Att. towards French Canadians	17	48.17	6.86
	H, High Att. towards French Canadians	19	46.94	6.16
	L, Low Att. towards French Canadians	12	44.42	7.04
	L, High Att. towards French Canadians	32	47.82	6.14
H,L	H, Low Att. towards Learning French	16	47.22	6.37
	H, High Att. towards Learning French	20	47.41	6.40
	L, Low Att. towards Learning French	15	44.10	8.08
	L, High Att. towards Learning French	29	48.60	3.32
H,L	H, Low Desire to Learn French	20	47.82	6.83
	H, High Desire to Learn French	16	47.28	5.97
	L, Low Desire to Learn French	15	44.62	6.74
	L, High Desire to Learn French	29	48.03	6.37
J,L	J, Low Att. towards Learning French	15	47.50	5.20
	J, High Att. towards Learning French	22	48.64	6.61
	L, Low Att. towards Learning French	15	43.84	8.08
	L, High Att. towards Learning French	29	48.47	3.32
J,L	J, Low Desire to Learn French	19	48.54	6.67
	J, High Desire to Learn French	18	48.43	6.11
	L, Low Desire to Learn French	15	44.41	6.74
	L, High Desire to Learn French	29	47.78	6.37

(c) the view that low attitude students may be responding to the teacher's personality rather than the specific teaching style creates another problem in interpretation of the present results. It is easy to see, however, that teaching style, as defined in this work, is itself a significant part of the teacher's personality, as style reflects basic dispositions towards democratic versus authoritarian attitudes or even priorities for linguistic perfectionism versus contextual inquisitiveness.

It should be noted that high attitude students taught with style H are always somewhat weaker in aural comprehension than high attitude students taught with style L. It is possible that style H is not an incentive for these students. It is equally possible that high attitude students in treatment L (Linear Language) are subject to the illusion, created by the strategy *Mechanical Use of Language* in this style, that they are actually learning how to function in the second language.

It appears, therefore, that while the actual mechanics of the processes which occurred singly or together could only be identified with more complex research, the present research design was sufficiently controlled by the comparison effect to disallow differences in language performance for low versus high attitude students other than those differences which radiated substantially or initially from the styles themselves.

The present data suggest that teaching styles may be capable of breaking the hold of a negative attitude by changing behaviours. Alternatively, they may entirely remodel attitudes. A delicate difference separates the two processes. The important issue is that different styles do produce dissimilar results for specific types of students.

The apparent compatibility between teaching style H and low attitude is not necessarily to be expected for all age groups. Allen and Corder (1974) express the view that the problems of advanced language learners are qualitatively different from those of younger learners. The present writer believes, for example, that it is entirely possible that as individuals grow older, low attitude students in *both* styles H and L could demonstrate a greater tolerance for the strategies of each style without attitudes to French or to French Canadians changing significantly. Conversely, high attitude students could develop a dislike for automatic drill as they grow older.

The fact that only three of twelve analyses of covariance produced the expected interactions at the .10 level of significance or better and that all these interactions related to the HL comparison suggests that, for this age group at least, this particular contrast (Lateral versus Linear Language) is more sensitive to the presence of specific attitudes than other comparisons studied between teaching styles. Further, the consistency noticed with respect to the effect of teaching styles HL on students and their performance is additional evidence of the validity of the LTRS. This view is supported by Rosenshine and Furst (1973) who state that the ultimate test of the validity of an observation instrument rests on whether or not it specifies treatment types which are related to differential student performance.

The main effect on aural comprehension in favour of high positive Attitudes towards Learning French for the HL and JL samples is not particularly surprising in view of previous research (e.g., Gardner & Lambert, 1972) establishing a relationship between attitudes and second language acquisition. A more revealing result was the main effect found for teaching style in the design which used the JL styles and Desire to Learn French as the independent factors.

The effectiveness of teaching style J (Balanced) for aural comprehension irrespective of the strength of the students' Desire to Learn French is reminiscent of the main effect found on aural comprehension in favour of style J (Gayle, 1982b) when styles JL and Aptitude in Sound Symbol Association were the independent factors. Since style J, of the three styles under discussion, has the most equable distribution of frequencies for strategies which are dominant in both Lateral and Linear styles, it could reasonably be expected to produce better results than style L on aural comprehension for all types of students.

These interpretations of the findings in the HL and JL comparisons would be grossly inadequate, however, unless it were added that the effect of any style must be understood in terms of the total configuration of discourse functions within it as well as its particular pattern of dominance over another style. For example, style J (Balanced), when compared with L (Linear Language), represents relatively greater exploitation of the categories 'reading,' 'writing,' and 'initiation' as well as most or all of the categories on the strategies *Verbal Processing* and *Direction*. This unique composition may be regarded as an effective instrument for strengthening aural comprehension.

In spite of the fact that style J is relatively more balanced and gave rise to a main effect in the JL designs, it did not produce a main effect in the HJ comparison. This is probably because the internal pattern of dominance for styles H and J is too similar. It is also worthy of note that the pattern of horizontal predominance for J in the HJ pair is somewhat different from the pattern for J in the JL pair.

This study has supported the view that teaching styles are educational phenomena to be reckoned with not only in the broader educational setting, but also in the narrower second language context. Second Language Teaching Styles, even within the same programme, have been found to make a difference. However, the influence of teaching style does not necessarily stretch across the board. It appears that often the relationship between teaching style and aural comprehension becomes significant when students with special characteristics are considered. Perhaps this is fortunate. Results of this nature do not encourage hasty and erroneous remarks regarding the supposed inherent merit of a particular teaching style over all others. What these results do is to quietly suggest that teaching styles may be sufficiently potent to enhance a good attitude making it even more powerful, or to reduce the already meagre effect of a low attitude to a negative quantity, or to counteract the expected effects of high and low attitudes leading to surprising returns.

It is believed that more than one of these processes may have been implicated in the differential results of this study. However, the reader who wishes to put the information regarding teaching styles under the magnifying glass should do so at the angle which brings the figures under review as a composite whole rather than as a fragmented and disjointed spectacle. In keeping with this principle, it is intended to extend, in the near future, the panorama and to look simultaneously at other dimensions of teaching, including the potency of interactivity among components in a style.

When the question of Style is discussed as an integrated composite the uniqueness of teachers as Artists becomes apparent. There is now room for creativity and their contribution to the learning process is etched in bolder outline, making them distinguishable above fellows of the same School who use the same brush, the same colours, and the same palette. It is not surprising that the dominant theme in a Teaching Style can be portrayed and can be identified with student production. Nor should it be surprising that, whereas the mortal may be unable to “dip his brush in dyes of heaven” as Scott says in his *Marmion*, yet there are fetching pastel shades and alluring tones available to the teacher which can be interspersed to catch the imagination of the student. The subject, therefore, of Styles defies complete orthodoxy. Teachers must first analyze their own style to find what it really achieves, must find the style best suited for their gifts, and must alter it if necessary so that Style may be the effective tool it can be in making or breaking attitudes.

Notes

1. It is to be understood that the two Rs (reading and writing) have necessarily to be recognized and included in discourse functions where they are interspersed with oral interaction.
2. All teachers in the present study were taken from this Programme. The Intensive Programme in French as a second language is organized to accommodate both Language Arts and Social Studies. This allows increased opportunity for the actual use of the second language which is the sole medium of communication during classroom interaction.
3. The *Verbal Processing* strategy differs from the Formal strategy (Stern, 1974) since it not only helps students study the language and monitor their use of the linguistic properties of the sentence, but it may also induce reflection on the content of what is being said.

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WISC-R Subtest Patterning of Below Average, Average, and Above Average IQ Children: A Meta-Analysis

Research on WISC-R subtest performance patterns of both retarded and above average IQ children has revealed a number of distinct differences. Retarded children perform relatively better on the Performance Scale subtests than on the Verbal Scale subtests while above average IQ children demonstrate a greater facility for Verbal over Performance Scale subtests. Although the research with exceptional groups appears well substantiated, few, if any, studies directly compare WISC-R profiles of exceptional children with those of normal children of average ability.

This study used meta-analytical procedures to compare WISC-R subtest performance patterns of 29 samples of retarded, average, and above average IQ children drawn from the recent research literature. The analysis resulted in three distinct WISC-R subtest profiles for the three groups. The retarded and above average children performed in line with previous research findings while normal children revealed a

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subtest score pattern reflecting aspects of both retarded and above average IQ children.

The study demonstrated that WISC-R subtest performance patterns are strongly related to overall intellectual level. The comparative performance of children across the individual WISC-R subtests and across subtest clusterings and factor groupings appears to change as a function of Full Scale IQ.

The *Wechsler Intelligence Scale for Children- Revised* (WISC-R) is presently the most popular psychometric instrument for the assessment of intellectual ability in individual children—both normal and retarded (Kaufman, 1980; Quattrocchi & Sherrets, 1980). Although the WISC-R standardization sample (Wechsler, 1974) was limited to “normal” children only and included no institutionalized or severely disturbed children, a number of studies have shown the reliabilities and stability of the three WISC-R Scales and most WISC-R subtest scores to be satisfactory for use with mildly and moderately retarded children (Covin, 1977; Lutey, 1977; Sattler, 1982; Vance, Gaynor & Coleman, 1977). Research has also shown the WISC-R to have essentially the same factor structure for retarded children (Van Hagen & Kaufman, 1975; Schooler, Beebe & Koepke, 1978) as for normal (Kaufman, 1975, 1980; Wallbrown, Blaha, Wallbrown & Engin, 1975) and gifted children (Karnes & Brown, 1980), thus supporting the notion of a relatively invariant structure of intelligence for school-age children regardless of their overall level of intellectual ability. Further, this WISC-R factor structure has been shown to be relatively stable across sex, socioeconomic status, age, and clinical diagnoses (Kaufman, 1979a, 1979b, 1980, 1981; Lutey, 1977; Quattrocchi & Sherrets, 1980; Sattler, 1982). At a practical level, such findings suggest that children from a broad range of educational and socioeconomic backgrounds, demonstrating a wide variety of academic and interpersonal behaviors, perceive the stimulus materials and tasks of the WISC-R in a similar fashion (Schooler et al., 1978).

However, this is not to say that there are absolutely no differences in the WISC-R performance of such exceptional groups as the mentally retarded or the gifted when compared to “normal” groups. Regardless of the similarity of the WISC-R factor structure across different groups of children, there is ample evidence that various exceptional groups do demonstrate differing patterns of performance (high vs. low scores) across the individual subtests of the WISC-R, and such characteristic patterns of subtest performance are viewed by many researchers as indicative of specific mental operations or brain-behavior relationships (Kaufman, 1980; Sattler, 1982). Thus, in spite of the fact that the WISC-R was designed solely as a measure of general intelligence (Wechsler, 1974), researchers have spent much time and energy searching for subtest performance profiles characteristic of specific clinical categories such as: the mentally retarded (e.g., Kaufman & Van Hagen, 1977; Naglieri, 1980; Vance, Hankins, Wallbrown, Engin & McGee, 1978), the learning disabled (e.g., Anderson, Kaufman & Kaufman, 1976; Moore & Wielen, 1981; Vance, Gaynor & Coleman, 1976), the emotionally disturbed (e.g., Dean, 1977, 1978; Hamm & Evans, 1978; Morris, Evans & Pearson, 1978), the delinquent (e.g., Hays & Solway, 1977; Hays, Solway & Schreiner, 1978; Ollendick, 1979), the intellectually superior (e.g., Karnes & Brown, 1980; Schiff, Kaufman & Kaufman, 1981; Wheaton & Vandergriff, 1978), and the neurologically impaired (e.g., Kunc & McMahon, 1979; Simensen & Sutherland, 1974; Swerdlik & Wilson, 1979; Tew, 1977) and, over the years, much interest has been generated in

applications of the WISC-R as a diagnostic aid for the classification of exceptional children (Kaufman, 1979a; Mueller, Mancini & Short, 1983; Quattrocchi & Sherrets, 1980; Vance & Singer, 1979). The results of such studies have been less than totally consistent (Dudley-Marling & Kaufman, 1981; Lutey, 1977; Sattler, 1982) and some controversy has arisen in regard to the validity of the WISC-R profile analysis approach to the classification of individuals (Berk, 1983; Gutkin, 1979; Hale & Saxe, 1983; Hirshoren & Kavale, 1976; Miller, 1980; Miller & Walker, 1981; Ryckman, 1981). This inconsistency largely exists because, although researchers have noted statistically significant WISC-R profiles that appear characteristic of certain exceptional groups, they have failed to demonstrate these profiles to be distinctive enough to differentiate between exceptional and normal children (Hale & Saxe, 1983). Researchers, such as Berk (1983), further argue that the application of evidence for characteristic group-profiles to the individual child is both problematic and fraught with sources of error. However, other researchers continue to see potential in further research within this area, arguing that a better understanding of the processes underlying differential performance on the WISC-R subtests may lead to more comprehensive understanding of the specific problems, strengths and weaknesses of various exceptional groups (Kaufman, 1979a, 1980, 1981; Sattler, 1982).

In regard to the mentally retarded, the literature suggests uneven patterns of performance on tests of intelligence when compared to children of average intellect. Early studies of the WISC performance of retarded children noted that Vocabulary, Arithmetic, and Information were consistently among the lowest subtest scores for these children, whereas Object Assembly and Picture Completion were typically highest (Baumeister, 1964; Silverstein, 1968; Thompson & Finley, 1962). More recent studies using the WISC-R (Kaufman & Van Hagen, 1977; Naglieri, 1980; Vance et al., 1978), while not in total agreement on the relative rankings of all the WISC-R subtests, have generally found a pattern similar to that reported for retarded children on the WISC. Kaufman and Van Hagen (1977) found three Performance Scale subtests—Picture Completion, Object Assembly, and Block Design—to be easiest for the children in their sample; with Vocabulary and Arithmetic the most difficult. Naglieri (1980) also found Object Assembly to be easiest and Arithmetic to be the most difficult for his retarded sample. Similarly, Lutey (1977), reporting the WISC-R subtest consensus ranking across 7 groups of retarded children, found Object Assembly and Picture Completion to be the highest subtest scores in 6 of the groups and Vocabulary and Information to be the lowest scores in 4 and 5 groups, respectively. On the other hand, Vance and his colleagues (1978) reported Picture Completion and Object Assembly to be the second and third easiest, respectively, and Information to be the most difficult subtest for their sample. Thus, ignoring some inconsistency in the exact ordering of WISC-R subtests from one sample of retarded children to another, it does appear that retarded children as a group generally do less well on the Verbal Scale subtests than on the Performance Scale subtests (Lutey, 1977; Vance et al., 1978).

A number of researchers (e.g., Clarizio & Bernard, 1981; Henry & Wittman, 1981; Smith, Coleman, Doeckei & Davis, 1977a, 1977b; Webster & Lafayette, 1980) have also attempted to determine whether mentally handicapped children show characteristic WISC-R performance patterns when subtests are grouped according to Bannatyne's (1974) recategorization system. Such studies have generally found retarded children to score highest on the *Spatial* cluster (Object Assembly, Block Design, Picture Completion) and lowest on the *Acquired Knowledge* cluster

(Information, Arithmetic, Similarities). There has been less consistency regarding the rank ordering of the *Conceptual* (Similarities, Vocabulary, Comprehension) and the *Sequential* (Arithmetic, Digit Span, Coding) clusters.

In contrast to the WISC-R pattern demonstrated by the retarded, the results of studies with children of above average intelligence (Karnes & Brown, 1980; Schiff et al, 1981; Thompson & Finley, 1962; Wheaton & Vandergriff, 1978) suggest that bright children tend to perform best on the Verbal Scale subtests and less well on the Performance Scale subtests—a pattern almost completely opposite that shown by their retarded counterparts. Again, the exact rank-ordering of the subtests varies from sample to sample but, clearly, the intellectually above average show relative strength on the Verbal Scale subtests that together define Kaufman's (1975) *Verbal Comprehension* factor—Information, Similarities, Vocabulary, and Comprehension. Similarly, Schiff, Kaufman and Kaufman (1981) reported that gifted learning disabled students scored highest on Bannatyne's *Conceptual* cluster and lowest on *Sequential*. The only point of similarity between the WISC-R subtest patterns of the retarded and the intellectually superior is that both groups seem to find the Arithmetic subtest to be relatively difficult.

The differences in the apparent patterning of WISC-R subtest scores in these two groups has been explained in various ways. Silverstein (1968) suggested that these differences may be due to the relatively concrete thinking patterns associated with mental retardation, whereas Alper (1967) suggested that retarded children may do more poorly on the Verbal subtests because of inadequate language skills and schooling experiences. Relatively poorer performance on the WISC-R Performance subtests by the intellectually bright may be explained by Kaufman's (1979c) finding that speed of performance becomes an increasingly important factor for high scores on many of the Performance subtests as children become older or for younger gifted children. At most age levels, superior scale scores on Block Design, Object Assembly, Picture Arrangement, and Coding can only be obtained by receiving some of the bonus points available for rapid test performance.

Although it appears that retarded children demonstrate a different pattern of WISC-R performance than do the intellectually superior, it is not yet clear how the patterns of the retarded and superior differ from that shown by normal children of average ability. Kaufman (1976c) presented data showing that the normal population demonstrates a surprising amount of subtest scatter on the WISC-R. Apparently, it is not particularly unusual for as many as four WISC-R subtests to significantly vary from the mean scaled score (based on 12 subtests) of a child in the normal population (Kaufman, 1976a). Since normal children do not demonstrate a completely flat WISC-R profile, the question remaining is whether or not there is a characteristic pattern of subtest performance for these children and whether such a pattern more closely resembles the pattern of retarded children or superior children. Another question to be answered is how WISC-R subtest rankings change with increasing general intelligence—from retarded to average to superior.

The present study uses meta-analytical procedures (Glass, 1976) to examine the WISC-R subtest performance patterns of 29 samples of below average, average, and above average IQ children drawn from the research literature on the WISC-R to determine whether there exist reliable subtest performance profiles characteristic of different levels of intellectual ability. Meta-analysis refers to the analysis of analyses or, in other words, to the statistical analysis of a large collection of results

from individual studies for the purpose of integrating findings. By comparing and contrasting a number of samples representing different intellectual classifications, the degree to which profiles uniquely and consistently differ, as well as the similarities among subgroups, may be ascertained.

TABLE 1
SOURCE AND DESCRIPTION OF THE 29 SAMPLES
SELECTED FOR META-ANALYSIS

Sample and Source	Mean FSIQ	Sample Size	Description
1 Henry & Wittman (1981)	63	40	EMH, mixed race and sex
2 Schooler et al. (1978)	69	127	EMH, mixed race & sex
3 Clarizio & Bernard (1981)	69	141	EMH, mixed race & sex
4 Rowe (1977)	60	44	EMH, Australian, mixed sex
5 Girona (1977)	64	20	EMH, mixed race & sex
6 Vance et al. (1978)	62	238	EMH, mixed race & sex
7 Catron & Catron (1977)	60	29	EMH, mixed race & sex
8 Kaufman & Van Hagen (1977)	51	80	EMH, mixed race & sex
9 Vance (1979)	63	126	EMH, wtd. mean of males & females, mixed race
10 Nagle & Lazarus (1979)	63	30	EMH, 16 yrs. old, mixed race & sex
11 Mueller (note 2)	62	20	EMH, mixed race & sex
12 Morris, et al. (1980)	63	78	EMH, mixed race & sex
13 Raviv et al. (1981)	101	60	Normals, Israeli boys
14 Hale & Landino (1981)	NA	34	Unimpaired clinic., mixed race, males only
15 Pristo (1978)	98	40	Normals, mixed race & sex
16 Schwarting (1976)	106	58	Normals, mixed race & sex
17 Stokes et al. (1978)	107	59	Normals, gr.6, mixed race & sex
18 Schooler et al. (1978)	92	269	Unimpaired clinic., mixed race & sex
19 Clarizio & Bernard (1981)	93	294	Unimpaired clinic., mixed race & sex
20 Peters (1976)	107	300	Normals, Canadian, wtd. mean of 3 groups, mixed sex
21 Sandoval (1982)	NA	332	Normals, Caucasian, mixed sex
22 Gutkin & Reynolds (1981)	NA	1868	Normals, Caucasian, mixed sex
23 Resnick (1977)	97	76	Normals, mixed race & sex
24 Wersh & Briere (1981)	116	91	"Normal", Canadian, mixed sex
25 Mueller (note 2)	121	28	Unimpaired high IQ clinic., Caucasian, mixed sex
26 Schiff et al. (1981)	123	30	Gifted LD, mixed race & sex
27 Wheaton & Vandergriff (1978)	140	26	Gifted, mixed race & sex
28 Karnes & Brown (1981)	126	946	Gifted, mixed race & sex
29 Henry & Wittman (1981)	130	40	Gifted, mixed race & sex

Method

Standard literature search procedures were utilized to locate research studies in which the WISC-R was administered to samples of children designated as either subnormal or mentally retarded, or average or normal or unimpaired, or above average or superior or gifted. Samples of children described as being predominantly brain-damaged, emotionally disturbed, learning disabled, or of ethnic minorities were excluded from analysis. The one exception, the Schiff et al. (1981) sample of

gifted learning disabled children, was included because of the dearth of “normal” gifted samples in the research literature. Subsamples of children designated as unimpaired or nonhandicapped drawn from larger clinic-referred samples were also accepted for inclusion within the present analysis. All selected samples were required to have a sample-mean FSIQ below 70, between 90 and 109, or above 115. A total of 12 below average, 11 average, and 6 above average IQ samples comprising a total of 5574 children were found suitable for use in this study. These 29 samples are referenced within Table 1.

For each of the 29 selected samples, the sample-mean scaled scores for each of the 10 regular WISC-R subtests (Digit Span & Mazes excluded) were used as the data-base (see Table 2).

TABLE 2
RAW SCALED SCORE DATA FOR THE 29 SAMPLES ANALYZED

Sample	Verbal Tests					Performance Tests				
	Inf.	Sim.	Ar.	Voc.	Com.	P.C.	P.A.	B.D.	O.A.	Cod.
1	4.0	4.6	4.0	4.6	5.2	6.2	3.8	4.2	5.7	4.4
2	4.7	4.6	4.9	4.7	5.4	6.9	5.7	5.4	6.4	5.1
3	4.7	4.7	4.9	4.4	5.3	6.9	5.7	5.6	6.2	5.1
4	4.0	3.2	3.3	3.5	4.8	6.7	5.1	5.2	5.4	3.4
5	2.7	4.0	5.1	4.6	4.9	5.2	5.1	4.2	6.5	4.7
6	3.5	3.6	4.8	4.0	5.5	5.4	4.0	4.2	5.0	4.3
7	3.2	3.3	3.8	3.6	5.0	5.2	4.3	3.8	5.0	4.3
8	2.8	3.0	2.1	2.0	3.0	3.8	2.7	3.2	3.2	2.6
9	3.6	3.6	4.9	3.9	5.5	5.6	4.0	4.3	4.9	4.3
10	3.8	4.3	4.1	2.9	3.9	5.6	5.2	4.9	6.5	5.2
11	3.3	3.1	3.7	3.3	4.0	6.9	3.3	5.2	5.8	3.9
12	3.6	3.5	5.1	4.1	5.2	6.3	3.7	4.2	5.3	5.3
13	9.9	9.8	10.2	10.0	10.5	10.1	10.3	9.7	10.7	10.0
14	8.9	8.8	8.2	9.3	9.2	10.1	11.3	9.7	10.7	6.5
15	9.0	9.6	9.8	9.3	8.4	10.0	10.4	9.6	11.6	8.6
16	10.2	10.5	10.1	11.6	11.7	10.5	11.2	10.7	11.5	10.6
17	10.6	11.3	11.4	11.1	10.9	11.0	11.3	11.2	11.3	10.5
18	8.1	8.2	8.2	8.6	9.1	9.9	9.5	9.0	9.7	8.2
19	8.1	8.3	8.2	8.7	9.1	9.9	9.5	9.1	9.6	8.3
20	10.4	10.7	11.0	11.0	11.3	11.1	11.3	11.1	11.0	10.9
21	10.4	10.3	10.2	10.8	10.0	10.7	10.3	11.1	10.5	10.7
22	10.4	10.3	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.2
23	9.1	10.3	9.0	10.8	9.4	9.7	9.6	9.5	10.4	9.1
24	11.9	12.5	11.3	12.2	12.6	12.5	12.6	12.2	12.6	11.1
25	12.3	14.1	12.3	12.6	13.5	12.7	12.6	13.1	13.0	11.4
26	14.6	16.2	12.1	15.5	14.4	12.2	13.0	12.7	12.4	9.6
27	16.1	16.9	14.4	15.7	17.1	14.7	14.9	15.5	15.7	12.8
28	14.0	14.5	13.4	14.7	14.5	13.2	13.3	13.0	13.2	12.2
29	14.2	14.8	13.1	15.5	15.7	13.4	13.5	13.9	13.9	11.8

The analysis of the scaled score data proceeded through a number of discrete steps. First, the set of 29 by 10 scaled scores was subjected to *K*-means clustering by way of the BMDPKM program (Dixon, 1981). The PKM procedure partitions a set of *n* cases or samples, each consisting of *k* variable scores, into clusters. At the completion of the procedure each sample belongs to the cluster whose center is closest to the sample. The Euclidean distance (*D*²) (Cronbach & Gleser, 1953) is

used to measure the distance between the sample and the center of each cluster. The PKM procedure begins with all the samples in one cluster and splits one cluster into two clusters at each step. Clustering continues until a user-specified number of clusters is reached, at which point, samples are iteratively reallocated into the cluster whose center is closest. Analysis was performed for 2, 3, 4, 5, and 6-cluster solutions. The solution resulting in the smallest number of clusters (minimum $n=2$ samples) of maximum homogeneity while simultaneously maximizing the average distance between clusters was accepted as optimal.

Groups of samples formed empirically by the clustering procedure were then subjected to a One-Way Multivariate Analysis of Variance (MANOVA) procedure (see Finn, 1974; Morrison, 1967). The program used (Hunka, 1980) carries out a one-way MANOVA on n groups by k dependent variables and permits the user to input contrast matrices for special contrasts and/or form linear combinations of dependent variables. Confidence intervals for each pair of group differences on each variable mean (including user-created variables made up of linear combinations of input variables) are calculated. Tests include Rao's approximate F and Heck's test. Main effects tests include a Helmert contrast matrix which is evaluated row by row. The MANOVA test for the equality of the vector of the variable means was followed by the production of simultaneous 95% confidence intervals for pairwise comparisons on each variable. A MANOVA main effects test of the parallelism of the profile line-segments across groups was permitted by the creation of 9 linear combinations of variables for each of the three groups. Each combination consisted of variable k minus variable $k+1$ (e.g., Information-Similarities, Similarities-Arithmetic, Arithmetic-Vocabulary, etc.). Each combination was tested for equality across groups and simultaneous confidence intervals contrasting pairs of groups on each profile line-segment at $\alpha .05$ were output.

Results

Table 1 presents the source and description of the 29 samples selected for the present meta-analysis. As may be seen, the sample-mean FSIQs range from a low of 51 to a high of 140 and the selected samples represent a fairly heterogeneous mix of children through this range of IQ scores.

Table 3 presents the results of the K -means clustering procedure for 2, 3, 4, and 5-cluster solutions. An examination of the triangular matrices of sample-mean Euclidean distances (D^2) within clusters versus the mean Euclidean distances between clusters across the presented clustering solutions suggests the 3-cluster solution to be the most optimal. The 5-cluster solution adds little to increased homogeneity of the clusters formed and has the disadvantage of creating a separate cluster consisting of only one sample, while the 2-cluster solution demonstrates inadequate relative homogeneity for the first cluster. The 4-cluster solution does appear to increase cluster homogeneity to some extent over the 3-cluster solution, but there is relatively poor separation between the second and third clusters. However, the 4-cluster solution may also be considered adequate.

Basically, the 3-cluster solution groups all 12 of the below average IQ samples into one cluster, all 11 of the average IQ samples into another, and all 6 of the above average IQ samples into a third cluster on the basis of similarity between sample WISC-R subtest profiles. The 4-cluster solution maintains the same below average and above average groupings of samples but splits the average IQ samples

into two separate groups: a lower average group and a higher average group. The subtest means, grand mean of the subtests, and standard deviation of the subtest means for each of the sample-groups defined by the 3- and 4-cluster solutions are presented in Table 4.

TABLE 3
CLUSTERING DATA FOR TWO, THREE, FOUR
AND FIVE-CLUSTER SOLUTIONS

Cluster	Samples in Cluster	Cluster Composition	Mean Distances in Standard Units Between and Within Clusters					Range of Distances from Cluster Center
			1	2	3	4	5	
1	17	11B+6C	1.44	--	--	--	--	.36-3.49
2	12	12A	5.69	.61	--	--	--	.35-1.54
1	6	6C	.87	--	--	--	--	.34-1.61
2	11	11B	2.95	.74	--	--	--	.31-1.11
3	12	12A	7.58	4.67	.61	--	--	.35-1.54
1	6	6C	.87	--	--	--	--	.33-1.61
2	6	6B	2.45	.36	--	--	--	.31-0.48
3	5	5B	3.59	1.28	.52	--	--	.42-0.65
4	12	12A	7.59	5.21	4.05	.61	--	.35-1.54
1	6	6C	.87	--	--	--	--	.33-1.61
2	6	6B	2.45	.36	--	--	--	.31-0.48
3	5	5B	3.59	1.28	.52	--	--	.42-0.65
4	11	11A	7.45	5.08	3.91	.52	--	.35-0.65
5	1	1A	9.04	6.64	5.53	1.69	.00	.00-0.00

- Notes: 1. A = below average samples, B = average samples, and C = above average samples.
2. Euclidean distances given are based on input data standardized by subtracting each sample's 10 subtest scores by that variable's grand mean over the 29 samples and dividing by the standard deviation of that variable across samples.

The group subtest profiles of the three sample-groups defined by the 3-cluster solution and of the four sample-groups defined by the 4-cluster solution were subjected to analysis using the MANOVA procedure described in the previous section. There was a significant multivariate main effect for profile elevation, $F(20,34)=15.9$; $p<.01$, when the profiles of the groups defined by the 3-cluster solution were tested simultaneously. Examination of the associated 95% confidence interval for each variable for each pair of group differences (see Table 5) reveals that the below average IQ (BA) group profile differs in level from both the average (A) and above average (AA) group profiles on all 10 WISC-R subtests. The A group profile, on the other hand, differs from the AA group profile only on 5 subtests: Information, Similarities, Vocabulary, Comprehension, and Block Design.

TABLE 4

SUBTEST MEANS AND STANDARD DEVIATIONS OF SAMPLE-GROUPS
DEFINED BY 3- and 4-CLUSTER SOLUTIONS

Test	Group BA		Group A		Group AA		Group LA		Group HA	
	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
Inf.	3.66	.64	9.56	.95	13.85	1.55	8.64	.45	10.32	.24
Sim.	7.79	.62	9.83	1.01	14.83	1.56	9.04	.90	10.48	.50
Ar.	4.23	.91	9.70	1.14	12.77	1.09	8.68	.72	10.55	.53
Voc.	3.80	.80	10.15	1.03	14.37	1.57	9.34	.88	10.82	.56
Com.	4.81	.78	10.00	1.05	14.63	1.59	9.04	.38	10.80	.63
P.C.	5.89	.94	10.31	.47	13.12	.83	9.92	.15	10.63	.38
P.A.	4.38	.97	10.46	.73	13.32	.86	10.06	.79	10.80	.51
B.D.	4.53	.72	10.09	.81	13.40	1.17	9.38	.31	10.68	.56
O.A.	5.49	.94	10.67	.66	13.47	1.21	10.40	.82	10.90	.44
Cod.	4.38	.80	9.42	1.39	11.48	1.10	8.14	.98	10.48	.33
Grand Mean	4.50	.82	10.02	.58	13.52	1.02	9.26	.80	10.65	.40

There also was a significant multivariate main effect for the group profiles when profile line-segments were tested for parallelism, $F(18,36) = 6.6$; $p < .01$. Examination of the associated 95% confidence interval for each profile line-segment for each pair of group differences (see Table 5) reveals that all three groups differ from each other only in the shape of the 4-point profile defined by their Information, Similarities, Arithmetic, and Vocabulary subtest scores. All three groups are similar to each other in having no difference in the slopes of the Picture Completion-Picture Arrangement line-segment and the Object Assembly-Coding line-segment. Group BA differs from group A in the shape of the five Verbal subtest line-segments and is similar in the shape of the five Performance subtest line-segments. Group A is different from group AA in terms of the 4-point profile defined by the Information, Similarities, Arithmetic, and Vocabulary subtests and is similar in respect to the 5-point profile defined by the Performance subtests. The subtest profiles for the three sample-groups defined by the 3-cluster solution are plotted in Figure 1.

For the 4-cluster solution, there was a significant multivariate main effect for profile elevation, $F(30,48) = 10.1$; $p < .01$, when the four profiles were tested simultaneously. However, examination of the associated 95% confidence interval for each variable for each pair of group differences (see Table 5) reveals that whereas the below average (BA) group differs on most subtests from the lower average (LA) group there is no difference between the LA group and the higher average (HA) group. Similarly, the HA group differs from the above average (AA) group only on Information, Similarities, Vocabulary, and Comprehension. The multivariate analysis for "elevation" differences between the four groups suggests that groups LA and HA could reasonably be combined to form one larger average group, as suggested by our 3-cluster solution.

TABLE 5

SIGNIFICANT DIFFERENCES BETWEEN GROUPS FOR ELEVATION
OF SUBTEST SCORES AND FOR SUBTEST-PAIR DIFFERENCES
(LINE-SEGMENTS) BASED ON SIMULTANEOUS CONFIDENCE
INTERVALS FROM MANOVA

	Group Comparisons								
	3-Cluster Solution			4-Cluster Solution					
	BA-A	BA-AA	A-AA	BA-LA	BA-HA	BA-AA	LA-HA	LA-AA	HA-AA
Inf.	*	*	*	*	*	*			*
Sim.	*	*	*	*	*	*		*	*
Ar.	*	*		*	*	*			
Voc.	*	*	*	*	*	*			*
Com.	*	*	*						*
P.C.	*	*		*	*	*			
P.A.	*	*		*	*	*			
B.D.	*	*	*	*	*	*			
O.A.	*	*		*	*	*			
Cod.	*	*		*	*	*			
Main effect for elevation:									
F(20,34) = 15.9; p<.01				F(30,48) = 10.1; p<.01					
I-S	*	*	*			*			
S-A	*	*	*			*		*	*
A-V	*	*	*			*		*	
V-C	*			*	*				
C-PC		*	*	*		*			*
PC-PA	*	*		*	*	*			
PA-BD									
BD-OA		*				*			
OA-Co							*	*	
Main effect for parallelism:									
F(18,36) = 6.6; p<.01				F(27,50) = 5.2; p<.01					

Note: an * denotes significance with alpha = .05.

There was also a significant multivariate main effect for the four group-profiles when profile line-segments were tested for parallelism, $F(27,50)=5.2$; $p<.01$. Again, however, examination of the associated 95% confidence interval for each profile line-segment for each pair of group differences (see Table 5) reveals little difference between the shapes of the profiles for groups LA and HA. These two groups differ solely in respect to the slope of the line-segment between Object Assembly and Coding. The subtest profiles for the two average groups defined by the 4-cluster solution are plotted in Figure 2.

Generally, the MANOVA procedures carried out support a 3-group interpretation of the 29-sample data with the resulting three profiles demonstrating significant differences in both score elevation and profile shape or subtest patterning.

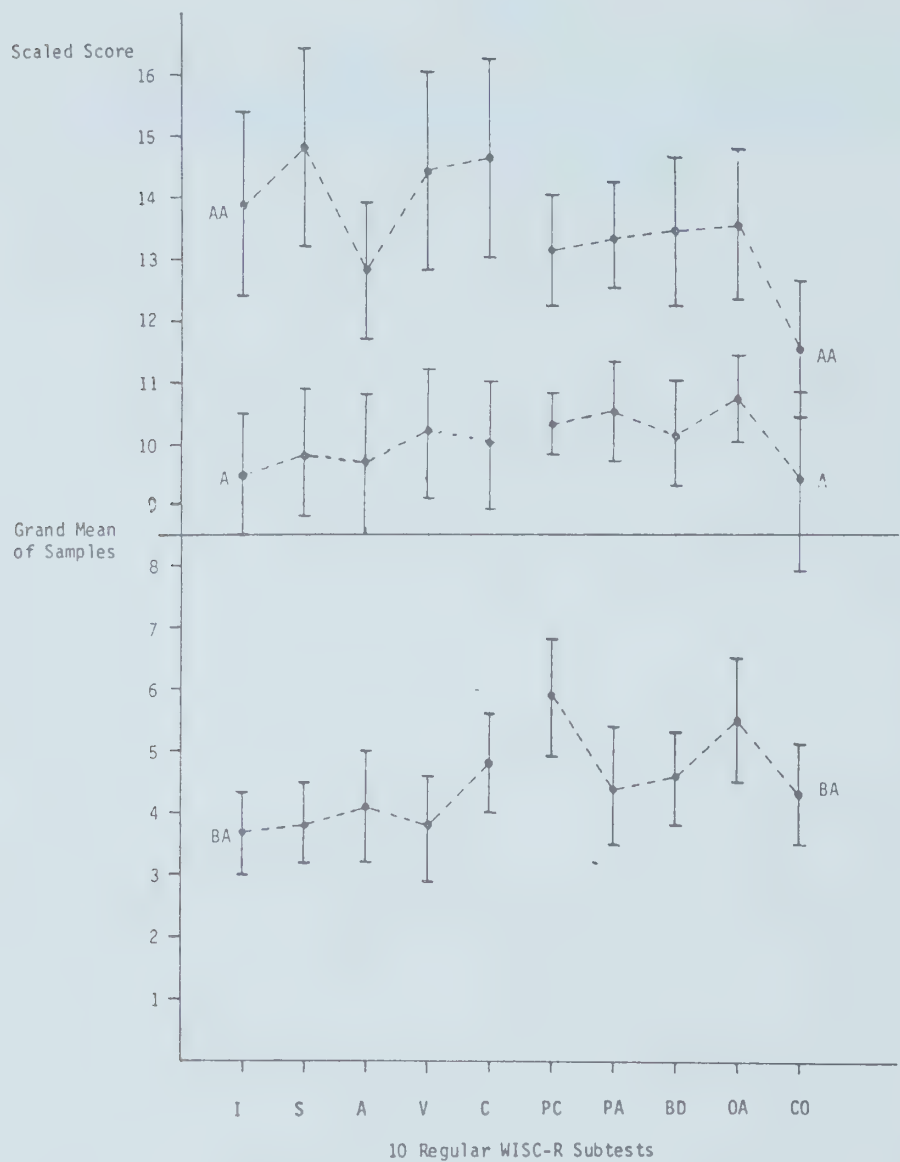


Figure 1. Mean subtest scores and S.D.s for below average (BA), average (A), and above average (AA) I.Q. clusters.

Discussion

Cluster analysis and MANOVA procedures applied to the WISC-R subtest profiles of 29 samples of children representing three levels of overall intellectual functioning revealed three relatively distinct performance patterns; one for below average IQ children, one for average IQ children, and one for above average IQ children. The subtest profiles that emerged for the below average and above average IQ groups of samples of this study are in reasonable agreement with previous research findings for retarded and bright populations (Kaufman & Van Hagen, 1977; Lutey, 1977; Naglieri, 1980; Schiff et al., 1981).

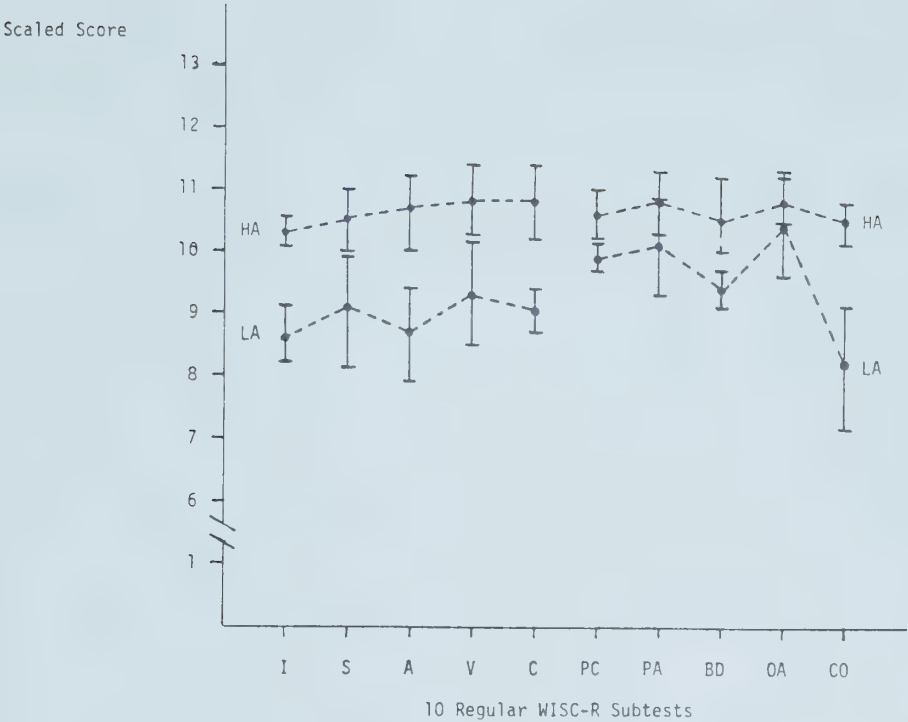


Figure 2. Mean subtest scales scores and S.D.s for lower average (LA) and higher average (HA) I.Q. clusters.

As a group, the below average IQ samples of this study tended to score lowest relative to their own mean performance level on three of the four WISC-R subtests which together form Kaufman’s (1975) *Verbal Comprehension* factor. Also, as might be expected, this group demonstrated relatively poor performance on the four subtests—Information, Similarities, Vocabulary, and Block Design—which have been reported to load most heavily and consistently on a general intelligence factor (Lutey, 1977; Wallbrown et al., 1975). On the other hand, the below average samples showed relatively good performance on two of the four subtests—Picture Completion and Object Assembly—that load on Kaufman’s *Perceptual Organization* factor. It appears that below average IQ children might be best characterized by a subtest profile of highest scores on the Picture Completion and Object Assembly subtests, middle scores on Vocabulary and Block Design, and lowest scores on Similarities and Information. Of the 12 samples of below average children included in our meta-analysis, 100% had Picture Completion rank 1 or 2 (highest score=1; lowest=10) and 83% had Object Assembly rank 1 or 2. Similarly, in 75% of the below average samples Similarities or Information ranked 9 or 10. Coding or Picture Arrangement ranked in the middle (5 or 6) in 67% of these samples.

In contrast to the below average group, the present analysis found the above average samples to score relatively high on all four of the WISC-R subtests which make up the *Verbal Comprehension* factor and to do less well on the four subtests which make up the *Perceptual Organization* factor. Above average IQ children appear to be best characterized by a subtest profile of highest scores on the Comprehension and Similarities subtests, middle scores on Object Assembly and Picture Arrangement, and lowest scores on Arithmetic and Coding. Of the 6 above

average samples included in this study, 100% had Comprehension or Similarities rank 1 or 2, 83% had Object Assembly or Picture Arrangement rank 5 or 6, 83% had Arithmetic rank 9, and 100% had Coding rank 10. Compared to the below average IQ group of samples, not one of the above average samples had Picture Completion rank first or Similarities or Information rank last.

Unique to the present study was an examination of WISC-R subtest patterning across a number of normal average IQ samples and, as might be expected given the results of Kaufman's (1976a, 1976b, 1976c) research on WISC-R subtest scatter in the standardization sample, the present analysis revealed average children to have a reasonably consistent and stable ordering of WISC-R subtest scores rather than a "flat" profile. Although it must be noted that the average samples showed less consistency in their profiles than did either the below average or above average samples, the average group of samples generally demonstrated a subtest score pattern that reflected aspects of the patterns of both the below average group and the above average group. Like the below average group, the average group tended to perform best on subtests that load on the *Perceptual Organization* factor of the WISC-R whereas, like the above average, they performed more poorly on the subtests which load the *Freedom from Distractibility* factor. Of the 11 samples which formed our average IQ group, 64% had Object Assembly or Picture Arrangement rank 1 or 2, 91% had Vocabulary or Block Design rank 5 or 6, and 91% had Arithmetic, Information, or Coding rank 9 or 10. Compared to the below average group where Picture Completion ranked 1 or 2 in 100% of the samples and Coding ranked 9 or 10 in 0%, for the average group Picture Completion ranked 1 or 2 in only 18% and Coding ranked 9 or 10 in 45%.

Interestingly, although the data from our samples did not include the Digit Span subtest, our average IQ sample tended to perform most poorly on three (Arithmetic, Coding, Information) of the four subtests which together comprise the *ACID* group of subtests (Arithmetic, Coding, Information, Digit Span) which have been implicated in the diagnosis of learning disabilities (see Kaufman, 1979a, 1980, 1981). Just as do the learning disabled, our samples of normal average IQ children also appear to find the *ACID* subtests relatively difficult. Possibly the "learning disabilities profile" suggested by a number of researchers as being characteristic of LD children (e.g., Clarizio & Bernard, 1981; Rugel, 1974; Smith, et al., 1977; Vance & Singer, 1979) is a more general characteristic of average IQ children.

In summary, although the WISC-R factor structure has been shown to be relatively invariant across IQ levels, the relative patterning of WISC-R subtests in children's profiles would appear to be related in some part to the overall level of the child's intellectual functioning. Such subtests as Information, Similarities, and Vocabulary tend to come earlier in ranking with increasing FSIQ while such subtests as Picture Completion, Arithmetic, and Coding tend to come later with increasing FSIQ. Retarded children demonstrate a distinctly different pattern of subtest performance than do average IQ children who, in turn, demonstrate a pattern that is different from that of the intellectually superior. In terms of the three-factor breakdown of WISC-R subtests suggested by Kaufman (1975), it appears that low IQ children may be characterized by the pattern *Perceptual Organization* > *Freedom from Distractibility* > *Verbal Comprehension*, that average IQ children may be characterized by the pattern *Perceptual Organization* > *Verbal Comprehension* > *Freedom from Distractibility*, and that bright children may be characterized by the pattern *Verbal Comprehension* > *Perceptual Organization* > *Freedom from Distractibility*.

Although the findings of this study should not come as a great surprise to any researcher or clinician familiar with the WISC-R and its legitimate uses, these results have important implications for future research aimed at determining characteristic WISC-R performance profiles for various diagnostic or exceptional groups. In future, such studies will need to demonstrate that the WISC-R performance pattern evidenced by a particular diagnostic group differs not only from a flat profile with a mean scaled score of 10 points, but also from the profile common to normal children of the same intellectual level. Certainly, a comparison of the characteristic profile demonstrated by many samples of learning disabled children to that of the average IQ group of this study would greatly decrease researchers' confidence in the utility of the WISC-R for differentiating learning disabled from normal children (see Berk, 1983; Miller & Walker, 1981).

While the three group profiles that have emerged from the present analysis are probably indicative of a specific trend of relative performance within the individual children comprising each group of samples, such an overall trend may or may not be consistent with the profile shown by any one sample or any individual child within a sample (Berk, 1983; Huelsman, 1970). At best, the present results are likely to be only generalizable to large groups of children of fairly homogeneous intellect. The authors do not suggest WISC-R group profiles be applied to the differential diagnosis of individual children; rather such group-profiles are more likely to be useful at a more molar level in suggesting broad cognitive differences between levels of intellectual functioning. In a general sense, WISC-R profiles are more likely diagnostic of intellectual-level differences than more subtle psycho-emotional differences within any one level of general intellect.

The possibility also exists that the profile differences among groups may be a function of the intercorrelations among subtests. Since the groups formed are differentiated on FSIQ, which is a composite of the 10 WISC-R subtests, subtests that are highly correlated with FSIQ would be expected to differentiate these groups in a similar manner. Subtests with low correlations with FSIQ would be expected to be less successful in differentiating such groups. Thus groups scoring at the two extremes of FSIQ would be expected to have mirror-image profiles. The authors are planning further study into profile differences as a function of the various subtests' squared multiple correlation with the remaining tests.

Finally, it is suggested that a meta-analysis of the WISC-R subtest data from all available research studies of retarded, learning disabled, normal, emotionally disturbed, delinquent, ethnic minorities, and gifted children would be invaluable in helping to settle the question of whether or not characteristic WISC-R profiles exist for groups defined by non-intellective criteria. It is the authors' contention that such a study will likely find that all diagnostic groups, except for the seriously brain-injured, will show patterns of WISC-R subtest performance similar to that of normal children of comparable general intelligence.

Notes

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